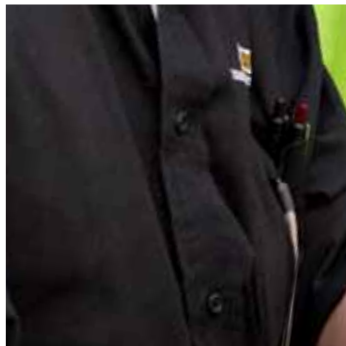
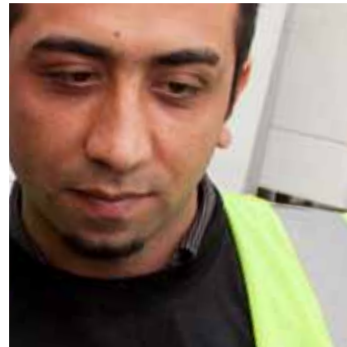




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How to teach vocational education: A theory of vocational pedagogy



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DEVELOPMENT

Bill Lucas, Ellen Spencer and Guy Claxton
December 2012

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Organisation overview

City & Guilds Centre for Skills Development

The City & Guilds Centre for Skills Development (CSD) is a not-for-profit research and development body for vocational education and training. We work to influence and improve skills policy and practice worldwide through an evidence-based approach. We are part of the City & Guilds Group. The desire to integrate evidence into skills policy and practice sits at the heart of what we do. That's why we work closely with policy makers, teachers, trainers and researchers to:

- Provide research that is relevant and practical to policy-makers, teachers, trainers and learners
- Understand current challenges and find evidence-based solutions
- Link research, policy and practice by sharing evidence and good practice
- Deliver skills development projects to test research findings and create good practice models.

If you want to find out more about how we are influencing and improving vocational education and training worldwide, visit our website at **www.skillsdevelopment.org**, and follow us on Twitter **@skillsdev**

Centre for Real-World Learning, University of Winchester

Established in 2008, the Centre for Real-World Learning (CRL) has brought together two internationally acclaimed thought leaders – Professor Guy Claxton and Professor Bill Lucas.

CRL's research focuses on two main areas:

- the science of learnable intelligence and the implementation of expansive approaches to education
- the field of embodied cognition and implications for practical learning and vocational education.

Selected CRL publications include:

Bodies of Knowledge; how the learning sciences could transform practical and vocational education (2010). London: Edge Foundation

Mind the Gap; Research and reality in practical and vocational education (2010). London: Edge Foundation

The Pedagogy of Work-based Learning: A brief overview commissioned by the DCSF 14-19 Expert Pedagogy Group (2010). London: DCSF

www.winchester.ac.uk/realworldlearning

www.expansiveeducation.net

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Glossary

157 Group	A membership organisation for Further Education colleges in England
AELP	Association of Employment and Learning Providers
AoC	Association of Colleges
ASCL	Association of School and College Leaders
ATL	Association of Teachers and Lecturers
BIS	Department for Business, Innovation and Skills
Cedefop	European Centre for the Development of Vocational Training
CBI	Confederation of British Industry
CSD	City & Guilds Centre for Skills Development
CPD	Continuing professional development
CRL	Centre for Real-World Learning, University of Winchester
DfE	Department for Education
ESRC	Economic and Social Research Council
FECs	Further Education Colleges
GNVQ	General National Vocational Qualification
IfL	Institute for Learning
IiP	Investors in People
ILM	Institute for Leadership and Management
LSIS	Learning and Skills Improvement Service
LSN	Learning and Skills Network
NAS	National Apprenticeship Service
NIACE	National Institute for Adult and Continuing Education
NVQ	National Vocational Qualification
OECD	Organisation for Economic Co-operation and Development
Ofsted	Office for Standards in Education
SSAT	Specialist Schools and Academies Trust
SSC	Sector Skills Council
TUC	Trades Union Congress
UCU	University and College Union
UKCES	UK Commission for Employment and Skills
UTC	University Technical College
VLE	Virtual Learning Environment

Foreword

This report, commissioned by the City & Guilds Centre for Skills Development, comes at a critical time for the UK economy and its need for a highly skilled workforce. As the economy begins to recover, part-time, low-skilled work seems to be on the increase. If the economy is to successfully grow, the UK needs more skilled individuals and more skilled work. This report sets out outcomes of vocational education that, we believe, have not previously been so effectively articulated. We argue that these outcomes are what employers and customers value. If employers value these skills, and better skilled individuals make for a better workforce, then it is on this basis that an economy can grow.

Our report builds on these outcomes to show how and why industries like care and retail, the growth areas of the 21st century, require a skilled workforce. In their roles, those working in these and other 'vocational' sectors require the routine expertise to deal with everyday problems, the resourcefulness to solve trickier problems, the functional literacies to explain their solutions to customers, the business-like attitudes to do so in a way which values the customer, the craftsman's desire to do a job well, and the wider skills for growth to innovate for future solutions. These outcomes of vocational education are the basis for a theory of vocational pedagogy that we hope the learning and skills sector will adopt.

The City & Guilds Centre for Skills Development, as part of the City & Guilds Group, is committed to high-quality vocational education, and this report provides a framework on which to provide it. We conduct research into a number of areas of vocational teaching

and learning, including, most recently, coaching (Insights: The Role of Coaching in Vocational Education and Training, 2012).

We have commissioned this report to show that vocational education is difficult, valuable, and should be respected in its own right. We want to move away from debates about parity of esteem by seeking to raise the status of vocational education through an agreed sector position on a framework of vocational pedagogy. Our report is unashamedly about provoking a debate across the learning and skills sector, working towards an agreed theory of vocational teaching and learning. We made a conscious decision to use the word 'pedagogy' because we are seeking to reclaim the word, so it can be used for vocational, and not just academic, education.

We anticipate that policy-makers will be most interested in the first half of the report, focusing as it does on the outcomes of vocational education and its different types, while practitioners may find the second half of the report provides advice on different teaching methods and when to use them. Together, the report is a robust and comprehensive theoretical framework for vocational pedagogy, one we hope the sector will begin to debate.



A handwritten signature in black ink that reads "Judith Norrington".

Judith Norrington
Director of Policy,
Research and Regulation
City & Guilds

Acknowledgments

The City & Guilds Centre for Skills Development and the Centre for Real-World Learning would like to thank the six individuals who agreed to be interviewed for this report: Lord Kenneth Baker, Sally Dicketts Principal of Oxford and Cherwell Valley College, HMI Lorna Fitzjohn, Professor Richard Pring, Andy Smyth from TUI Travel plc, and Professor Alison Wolf. Their time and comments have been invaluable to this research, and we extend our thanks to them for their involvement thus far.

We would also like to thank those who attended our appreciative inquiry workshop, for enabling our researchers to test ideas about vocational pedagogy and discuss the broad principles: Christian Amadeo, Darrell Bate, Charmain Campbell, Karen Davies, Peter Harvey, Chris Hyde, Kate Menzies, Andrew Morris, Karen Morse, Ela Owen, Maxine Smith, and Geoff Stanton. Their organisations are listed in appendix 1.

Finally, we would like to thank all those involved in the production of this report and its publication: Charlynn Pullen, Kathleen Collett, Heidi Agbenyo, Taiye Aro and Raqaiyah Khwaja.



Executive summary

This report, commissioned by the City & Guilds Centre for Skills Development, offers a theoretical underpinning for a vocational pedagogy. It is intended as a contribution to current discussions about further improving the quality of teaching and learning in the vocational education (VE) sector. It has been written largely with policy-makers and sector leaders in mind and specifically to support work being led by the *McLoughlin Commission on Adult Vocational Training and Learning* and by the *Richard Review of Apprenticeships*. In developing this report expert opinion was sought from a number of specialists in the field of vocational education, including Professor Alison Wolf and Lord Baker. A review of current thinking about vocational education forms a substantive part of the report, and its range of sources is reflected in the list of references at the end. We hope that it will also be useful to BIS, DfE and the various agencies and organisations which support the vocational sector.

The scope of vocational education

Vocational education, we argue, has an overall goal of the development of working competence and six specifically desired outcomes:

- 1 Routine expertise: mastery of everyday working procedures in the domain.
- 2 Resourcefulness: having the knowledge and aptitude to stop and think effectively when required.
- 3 Functional literacies: adequate mastery of literacy, numeracy and digital literacy.
- 4 Craftsmanship: an attitude of pride and thoughtfulness towards the job.

- 5 Business-like attitudes: understanding the economic and social sides of work.
- 6 Wider skills for growth: having an inquisitive and resilient attitude towards constant improvement – the ‘independent learner’.

A vocational pedagogy

Our research confirms what others have found – that there is, as yet, insufficient understanding about the relative effectiveness of teaching and learning methods used in vocational education. We offer a proof of concept that it is indeed possible to develop a vocational pedagogy, and we clearly show how a vocational pedagogy can be developed.

As one way of thinking about the variety of vocational education, we offer a broad categorisation to promote more precise discussions about the most appropriate learning methods:

- 1 physical materials
- 2 people
- 3 symbols (words, numbers and images).

The evidence is clear that vocational education needs to be taught in the context of practical problem-solving, and that high-quality vocational education almost always involves a blend of methods. The best vocational education learning is broadly hands-on, practical, experiential, real-world as well as, and often at the same time as, something which involves feedback, questioning, application and reflection and, when required, theoretical models and explanations.

We identify a number of tried and tested teaching and learning methods:

- including learning by watching
- by imitating
- by practising (trial and error)
- through feedback
- through conversation
- by teaching and helping
- by real-world problem-solving
- through enquiry
- by thinking critically and producing knowledge
- by listening, transcribing and remembering
- by drafting and sketching
- by reflecting
- on the fly
- by being coached
- by competing
- through virtual environments
- through simulation and role play, and
- through games.

Our view is that vocational teachers need a clear understanding of the variety of learning methods that lead to different learning outcomes, before they can make informed and effective pedagogical decisions. In general, a teacher's teaching is only as good as his or her ability to harness the kinds of learning that reliably lead to development of the desired outcomes. Without this process of thinking through the relationship between desired outcomes and instructional design, neither teaching nor learning are likely to be good enough.

We offer an approach to decision-making which invites consideration of 10 key areas to facilitate best possible decisions about pedagogy:

- 1** Role of the teacher.
- 2** Nature of activities.
- 3** Means of knowing.
- 4** Attitude to knowledge.
- 5** Organisation of time.
- 6** Organisation of space.
- 7** Approach to tasks.
- 8** Visibility of processes.
- 9** Proximity to teacher.
- 10** Role of the learner.

Importantly, we explore the contexts of vocational education – people, places and cultures – and the complex demands these bring with them.

Next steps

We make a number of suggestions about how best to take this vital debate forward:

- We ask policy-makers to engage with our findings to determine ways in which they can help to improve the quality of teaching and learning in vocational education by a rigorous debate about vocational pedagogy, actively contributing to the work of the *McLoughlin Commission on Adult Vocational Training and Learning* and the *Richard Review of Apprenticeships* and engaging more widely with international debates.
- We advocate the creation of a national centre of excellence for vocational teaching and learning linked to a network of regional hubs.
- We suggest that a broad and representative group of the organisations which most influence vocational education are brought together, to discuss the need for a vocational pedagogy and what practical implications this might have for the vocational education sector, especially for leadership, resourcing, training, implications for further research, opportunities for new forms of school such as UTCs and Studio Schools, opportunities for the next stage of the expansion of apprenticeships and barriers to improving teaching and learning and ways of overcoming these. This may be in the form of the FE Guild.
- We propose that a national dialogue with the vocational education sector is initiated, possibly as part of the McLoughlin Commission's ongoing work, to engage practitioners in discussion about the goal and outcomes of vocational education, and the teaching and learning methods which work best in their various contexts.
- We propose that a vocational pedagogy framework document be produced, drawing on our report and the expertise of other specialist centres. Such a document would be of use as a strategic sector planning tool at one end of the spectrum and as a framework for pedagogic choices within individual lessons for practitioners.
- A number of areas for more specific further research arise from our report. These include:
 - understanding and creating better coaching in vocational education drawing, for example, on sports science and other forms and models of coaching
 - understanding more about how the flipped classroom can be applied in vocational education
 - and developing a more detailed route map and flow diagram from the considerations we have outlined in our report, to scaffold practitioners' pedagogical development and design in vocational education.

1

Introduction



1.1 The need for a vocational pedagogy

The effectiveness of all education systems depends critically on the quality of teaching and learning in the classrooms, workshops, laboratories and other spaces in which the education takes place¹. While outstanding teachers (including lecturers, trainers, tutors, and coaches), engaged students, well-designed courses, facilities which are fit for purpose, and a good level of resources are necessary if any kind of educational provision is to be excellent, they alone are not sufficient. The real answers to improving outcomes from vocational education lie in the ‘classroom’, in understanding the many decisions ‘teachers’ take as they interact with students.

Specifically we need to understand more precisely how you best engage particular kinds of learners to undertake the particular kind of learning on which they are embarked to achieve whatever vocational outcomes are desired. This is the essence of what we understand by ‘vocational pedagogy’ and what we will be exploring in this report. The evidence suggests that serious consideration of pedagogy is largely missing in vocational education and we will argue that vocational learners are the losers as a result of this omission.

In English education, pedagogy was until recently an under-used concept. Debate has tended to be dominated by discussions of structures, funding, syllabus and assessment. A recent exception to this was the deliberate attempt by the Qualifications and Curriculum Agency (Centre for Education and Industry: University of Warwick, 2008) to provoke a discussion about the best ways of teaching the Diploma when it was introduced in 2008. Curriculum designers and teachers were invited to reflect on which learning approaches might be most likely to lead to the desired outcomes of this new qualification. Would learners in specific occupational sectors benefit more, for example, from watching an expert demonstration or through trial and error, by being coached or by undertaking their own enquiry? These are often difficult questions, calling on the skills of teachers, their understanding of learners, the nature of the subject² and the broader context in which it is being taught. But these kinds of questions are the stuff of pedagogy and the way they are answered impacts directly on the quality of learners’ experiences in vocational education. There are also welcome signs of change in the attitude of Ofsted. Their new framework for the learning and skills sector places a much more explicit focus on the quality of learning and teaching. We seek to add to this revitalisation of concern with pedagogy.

¹ There are a huge range of different designed learning environments in VE but, unless we are focusing on a specific space, we will use the word ‘classroom’ throughout the rest of this report for ease of understanding. Similarly, in FE, the role of teaching is carried out by a number of people: lecturers, trainers, coaches, and tutors. Unless referring to one of these specific roles, we use the term ‘teacher’.

² When we use the term ‘subject’ we are referring to the teaching content and material to be covered in preparing learners for a specific occupational sector or vocation. There will be many ‘subjects’ covered in preparation for a given vocation.

Pedagogy, in our view, is the science, art, and craft of teaching. Pedagogy also fundamentally includes the decisions which are taken in the creation of the broader learning culture in which the teaching takes place, and the values which inform all interactions³.

Pedagogy has been neglected partly because it is undeniably complex, leading some agencies to prefer to focus on more controllable factors such as qualifications, funding or a nebulous notion of 'teacher quality'. Teaching methods can also become political footballs, one method being labelled 'traditional' while another, equally unhelpfully, seen as 'trendy'.

When vocational education and training systems were initially created, discussions about vocational pedagogy were likely to be derived from the principles of general education. Even today, there is a sense in which vocational pedagogy sits in a no man's land between what is taught, in colleges and by training providers, and what is needed in the workplace. And too often employers complain that the content taught does not connect closely enough with the requirements of a particular occupation.

Vocational education faces two major challenges. Firstly, the dual worlds of educational institution and workplace require two sets of expertise – teachers with current experience of the workplace and workers who can teach. And many vocational learners have diverse needs which may be challenging. Of whatever age, vocational learners may not have had fulfilling experiences in their general education to date leaving their motivation impaired. Alternatively they may be so hungry for paid employment in the real world that they are impatient to leave formal education. Any approach to vocational pedagogy will need to respond to these additional challenges.

1.2 Current interest in vocational pedagogy

We believe that an exploration of vocational pedagogy is timely given a number of debates, reviews and initiatives which have brought it into focus:

➤ The role and nature of vocational pedagogy is currently being debated by the Commission on Adult Vocational Teaching and Learning⁴, chaired by Frank McLoughlin. The commission, announced in December (BIS, 2011) was established as a response to the Wolf Review and aims to raise the quality, and improve the outcomes and impact, of adult vocational teaching and learning in the further education and skills sector for learners and employers. Two of the Commission's aims are to appraise the range of pedagogical approaches to adult vocational teaching, and to develop a framework that will raise the quality of teaching and learning.

³For a classic discussion of the term pedagogy see Watkins, C. & P. Mortimore (1999). *Pedagogy: What do we know?* In Mortimore, P. (ed.) *Understanding Pedagogy and its Impact on Learning*. London: Paul Chapman Publishing Ltd.

⁴The homepage for the independent Commission can be found at: <http://www.excellencegateway.org.uk/cavtl>

- The recent report *Professionalism in Further Education* (BIS, 2012), chaired by Lord Lingfield, raised significant concerns about the professional development and teaching qualifications of those in the FE and skills workforce.
- In 2011, the *Review of Vocational Education – The Wolf Report* made a number of recommendations overhauling the qualification system to ensure greater rigour and higher quality and, in the process, reconceptualising our approach to vocational education in England.
- The Nuffield 14-19 Education Review (Pring *et al.*, 2009) was a six year independent review of education and training, completed in 2009 and overseen by Professor Richard Pring. Its guiding question asked what constituted an educated 19 year old in today's society. The review concluded with a call for a re-assertion of a broader vision of education; one that looked beyond 'skills'. It called for a more unified system of qualifications and better success measures.
- The current expansion of apprenticeships is central to the government's skills strategy for further education and the skills sector – *Skills for Sustainable Growth* (BIS, 2010) with the target of an additional 75,000 apprenticeship places by 2014. The *Richard Review of Apprenticeships* for BIS is looking at, among other things, how to ensure training is of high quality. The Association of Colleges (2012) recently published its response to this review.
- The central role of teachers in 14-19 education was explored by the Skills Commission in their *Inquiry into Teacher Training in Vocational Education* (Skills Commission, 2010), chaired by Sir Mike Tomlinson. One of its core recommendations was that 'research into vocational pedagogy should become a research priority for the sector'.

The City & Guilds Centre for Skills Development has already been influential in raising important issues with regard to vocational skills. In its publication *Effective Teaching and Learning in Vocational Education* (Faraday, Overton & Cooper, 2011) it found that teaching models were rarely used in vocational learning. Teachers tended not to refer to such models when deciding which teaching strategies to use in order to respond to particular learning objectives. It concluded that 'teaching models are not yet established in vocational learning in either the language or as concepts', and recommended that 'substantial further research to further develop teaching models' be undertaken. The same report bravely sought, retrospectively, to provide theoretical frameworks for the teaching it observed and usefully proposed a framework for developing effective vocational teaching and learning – in other words, the development of a vocational pedagogy. Through empirical research, City & Guilds has developed a framework for effective vocational teaching and learning which, while not fundamentally different from many other approaches, significantly emphasizes the role of 'context' in vocational education.

This report, commissioned by the City & Guilds Centre for Skills Development and produced by the Centre for Real-World Learning at the University of Winchester, provides a timely exploration of vocational pedagogy that will, we hope, help government, practitioners, employers, policy-makers and researchers, in England and further afield, improve the quality of vocational teaching. We aim to develop a well-grounded and useful theoretical underpinning for vocational pedagogy that will provide a structure in which vocational teachers can develop quality, effective teaching and learning programmes.

Working back from the overarching goals of vocational education, we seek to characterise the full variety of vocational education and its desired outcomes, to describe some of the characteristics of vocational learners and their teachers, to understand the contexts in which vocational education is provided and offer an overview of effective vocational teaching and learning methods.

We then bring this all together to consider how vocational teachers can use such thinking to take the best possible decisions in their many different ‘designed learning environments’ (classrooms, workshops, studios, training rooms etc) and so develop the best possible vocational pedagogy for the context in which they teach.

2

Our approach



2.1 Purpose of this chapter

In this chapter, we lay out our approach to the research, describe the scope of our work and offer an historical and philosophical perspective on the idea of vocational pedagogy and why it has been under-developed.

2.2 Research methods

The core of our work has been a review of the literature relating to vocational pedagogy. This has included web searches to capture recent discussions by others about the development of a vocational pedagogy, including those stimulated by the McLoughlin Commission on Adult Vocational Teaching and Learning, see for example, the IFL report (Harkin, 2012) produced for the Commission⁵.

In addition we brought together a number of expert practitioners⁶ working in the field of vocational education using an Appreciative Inquiry approach (Cooperrider and Whitney, 2005). The session sought to encourage discussion and debate around a number of questions of central importance to our research:

- 1 What is happening in practice when vocational education is a really positive experience for learners and teachers?
- 2 What is the ultimate goal of vocational education?
- 3 What is distinctive about practical and vocational learning?
- 4 What are vocational learners doing when they are learning well?
- 5 What teaching methods work best?

⁵Information about the preparatory work of IfL can be found at <http://www.ifl.ac.uk/policy-and-campaigns/current-policy-priorities/independent-commission-into-adult-education-and-vocational-pedagogy>. IfL also conducted an 'action research' project A Week in the Life Of with 100 expert vocational teachers. This project sought to gain perspectives on the experiences and challenges faced by vocational teachers and trainers in their day-to-day work by asking them to keep reflective diaries.

⁶See Appendix 1 for a list of those who attended.

- 6 What sources of knowledge, expertise, and best practice do teachers use to help them teach well?
- 7 What could make vocational teaching and learning even better?
- 8 What are the challenges for creating outstanding vocational teaching and learning?
- 9 How might these challenges be overcome?
- 10 What kinds of things might be included in a vocational pedagogy?
- 11 How can we make sure that a vocational pedagogy is useful and draws both on best practice and best thinking?

We also carried out semi-structured interviews with six key thinkers in the areas of vocational education and vocational pedagogy in order to learn:

- 1 Why they thought there is a lack of a widely accepted framework for discussing vocational pedagogies, and how the existence of well-researched vocational pedagogies might improve practice.
- 2 Which learning processes sit at the heart of high quality vocational education, and whether our emerging list of these processes was helpful.
- 3 Which are the key decision areas for vocational teachers, and whether our approach to this was helpful.
- 4 Whether they agreed with our emerging findings and overall approach to the development of vocational pedagogy.
- 5 What we had missed that we might usefully include.

We interviewed six experts.

- Lord Kenneth Baker of Dorking is founder of the Baker Dearing Trust, an educational trust set up to promote the establishment of university technical colleges (UTCs) in England. As education secretary in the 1980s, he oversaw the introduction of the National Curriculum and of in-service training days for teachers.
- Sally Dicketts is Principal and Chief Executive of Oxford and Cherwell Valley College, Oxfordshire's largest provider of FE. Sally sits on a number of local and national charities and boards, including The Association of Managers in Education and is an advisor to the National Education Trust.
- Lorna Fitzjohn, HMI, is responsible for Ofsted inspection policy development in learning and skills including further education, work-based learning and prison education. She has also held senior roles in the post-16 sector in a number of organisations, including in a large FE college.
- Professor Richard Pring was Lead Director of the Nuffield Review of 14-19 Education and Training between 2003 and 2009, and has written extensively about vocational education. Prior to this he was Director of the Department of Educational Studies at Oxford University, with which he continues to work.

➤ Andy Smyth is Accredited Programmes Development Manager at TUI Travel UK and Ireland, which is part of TUI Travel Plc. Prior to joining TUI in 2005, Andy had eighteen years' experience in the logistics industry in operational and management roles. Andy works closely with government to review and update policy, and is an active member of three boards looking at learning and skills and how they contribute to growth.

➤ Professor Alison Wolf is Professor of Public Sector Management at King's College London, where her specialist interest is training and skills policy. She is a specialist adviser to the House of Commons Select Committee on Education. The Wolf Review of Vocational Education for the Secretary of State for Education made a number of recommendations for the improvement of vocational education for 14-19 year-olds.

Our expert panel has provided us with healthy challenges and offered many useful insights. Some of their comments appear throughout our report. The interviews served to enrich and challenge our thinking ensuring that the arguments we developed are robust and relevant.

2.3 Scope of the review

In June 2012 we were commissioned by the City & Guilds Centre for Skills Development to develop a theoretical underpinning of vocational pedagogy to be ready for publication in December 2012. As well as contributing to the debate in the vocational education sector about vocational pedagogy, we were specifically invited to promote a better understanding of practical knowledge. While our focus has mainly been on England, the literature and web references we have explored have been international. We hope that our findings will stimulate discussion across the world.

We define a '**vocation**' as a form of work and our primary focus is on vocational expertise which is remunerated. While there may also be intense job satisfaction, this report excludes expert things done primarily for leisure (sports and games), for domestic use (day-to-day cooking, gardening, DIY, driving), or mainly for their intrinsic satisfaction.

We explicitly declare our beliefs, supported by the evidence we have reviewed, that practical and vocational learning can be immensely fulfilling; often, as has been compellingly argued (Crawford, 2010) **more so** than much so-called 'brain-work'.



While we have sought to learn from practices in a range of vocations, we have aimed primarily at those which are taught to adults and young people who may or may not have higher qualifications in colleges rather than on the vocational education which is taught largely in universities – medicine, the law, engineering, for example.

Within ‘**work**’, we include both employed (‘having a job’) and self-employed activity. With the decline of jobs in many traditional trades in large, established companies, we think it is essential to see vocational education as aiming to give all students the knowledge, confidence and attitudes needed to pursue their vocation entrepreneurially.

There is no agreed definition of **vocational education** in England. Our working understanding is that vocational education is the ‘provision of materials, activities and teaching that is designed to prepare people to function, at a specified level, in specific roles in the context of (usually) paid employment’ (Lucas, Claxton & Webster, 2010, p. 3). We thus use vocational education to mean the orchestration of strategies and structures so that learning leads to its desired outcomes. Vocational education is concerned with courses, timetables, syllabuses, qualifications and so on. Vocational education concerns the development of practical competence within, or for, a defined work ‘domain’. We believe that two other elements suggested by Chris Winch are important too – the element of personal development and the enabling of young people to see how their work and their place in the economy has a wider impact on society, (Winch, quoted in Lucas *et al.*, 2010: 4).

In thinking about pedagogy, we have come to the view that one aspect of what really matters in vocational education has been particularly neglected: a pride in craftsmanship (Crawford, 2010; Rose, 2005; Sennett, 2008) and excellence (Berger, 2003) and we specifically include this in our approach to the development of a vocational pedagogy.

The vocational education we are mainly thinking of is what you might expect to see in the prospectus of a general FE college or non-specialist publicly funded training provider anywhere in the UK. It might be being learned by young adults or older adults. While we recognise that there are some specific differences in the way education is experienced by older learners (Knowles, 1970) the evidence we have looked at suggests that the broad approaches to vocational pedagogy which we are offering suit young and older adults alike. Where there are important differences of emphasis, we describe these.

Vocational pedagogy, as we have already suggested, is the science, art, and craft of teaching that prepares people for certain kinds of working lives. It is critically shaped by the decisions which are taken by teachers – both high-level strategies, and day-to-day ‘in-the-moment’ ones – and the values which inform all interactions with students. Pedagogy is necessarily concerned with the particular practices and processes by which knowledge is produced, skills are developed and habits of mind are cultivated. In this report we will seek to avoid providing simplistic binary alternatives whenever we are considering pedagogic choices.

Pedagogy is a word which is used with ease on the continent but not in this country.

Richard Pring

Values and beliefs about the specific purposes of education will inevitably influence the choices teachers make. They will influence the selection and design of courses and the decisions taken, consciously or unconsciously, about pedagogy. Teachers who see themselves as guardians of knowledge will necessarily adopt different approaches to those who prefer to act as facilitators of knowledge construction with learners. 'Classroom' decisions stem from long-term opinions such as 'what is the purpose of education in the 21st century?' to the more immediate, for example, 'how might I construct my questioning of learners so that they view 'knowledge' as changing and constructed by them, rather than fixed and certain?'

Vocational pedagogy is then the tactical orchestration of classroom talk, activities, challenges, groupings, environments, available resources, role models and so on. This report focuses on vocational pedagogy rather than the other aspects of vocational education which have been well-covered by others.

The term 'pedagogy' is not one that people necessarily relate to or understand. I don't think it's a particularly helpful term, and it may turn off those people that we really need to engage.

Lorna Fitzjohn

The word 'pedagogy' means nothing to most British people. We should use words that people understand.

Lord Baker

2.4 A contextual note on the lack of a vocational pedagogy

Discussions of vocational pedagogy in England are rare. There are a small number of academic and third sector centres⁷ with a sustained interest in vocational pedagogy and a similarly small number of academic and policy papers which place the words 'vocational' and 'pedagogy' side by side as their major focus⁸.

The emphasis is normally on those elements of vocational education which are easier to deal with – structures, systems, qualifications and national bodies – rather than on pedagogy. Maybe it is a term that few people identify with as yet. In a number of European countries and in Australia, however, vocational pedagogy is regularly discussed. The OECD has consistently shown interest in going beyond the surface of vocational education and considering aspects of vocational pedagogy. We believe that pedagogy is an important term, and one which we cannot afford to ignore until we have a better synonym for it.

⁷ For example, our own Centre for Real-World Learning at the University of Winchester; City & Guilds Centre for Skills Development; the Centre for Research in Higher, Adult and Vocational Education at the University of Nottingham; the Institute of Education at the University of London and Kings College London.

⁸ A Google Scholar search throws up a 'mere' 70,500 items of which the vast majority are not relevant to the discussions in this report

In this report we have drawn on a wide variety of earlier thinking; from John Dewey's progressive arguments of a century ago (1916) to, Lauren Resnick's (1987) current thinking about out of school pedagogy; from specific reviews of vocational pedagogy such as The Tavistock Institute's submission to the ESRC in 2002 (Cullen *et al.*), to more general meta-analytic works from which we can glean specific vocational pedagogic insights as in the work of, for example, John Hattie. We have also looked especially carefully at specific critiques of the status quo such as Yrjö Engeström's advocacy of expansive approaches to workplace learning – further developed by Alison Fuller and Lorna Unwin (2003) with regard to apprenticeship and Frank Coffield's powerful review of the effectiveness of learning styles and their link to pedagogy, as well as an extensive range of literature on teaching and learning.

In 2012, the OECD published its Skills Strategy. Although broader in scope than our review, the OECD suggests that if vocational education and training are to serve the needs of the 21st century, then:

- Knowledge needs to be more relevant, and a better balance struck between the conceptual and practical, suggesting a particular role for programmes incorporating on-the-job training such as apprenticeships;
- Higher order skills, such as the 'Four Cs' of creativity, critical thinking, communication and collaboration, are essential for absorbing knowledge;
- Character traits, both performance-related (adaptability, persistence, resilience) and moral (integrity, justice, empathy and ethics) need to be shaped both at school in the workplace to help individuals to be active and responsible citizens; and
- Meta-layer skills, such as learning to learn, building expertise, fostering creativity and making connections across disciplines, are becoming more important in a world of growing complexity⁹.

There is currently a lack of widely accepted vocational pedagogy partly because the sector is constantly changing, so the ground rules for vocational education change. There is a misunderstanding about who vocational education is for. Is it for students or is it for employers? The qualification regime is trying to do too many things. Is my catering course letting me know what my skill levels are to improve and move on to the next level, or is it access to Higher Education?

Sally Dicketts

⁹ Quoted in Richard Review of Apprenticeships (2012). London: BIS.

As well as the kinds of issues indicated here, we note that there seems to be a returning interest in the importance of pedagogy in England generally. Examples of recent publications include *The Power of Pedagogy* by Jenny Leach and Bob Moon (2008), Diana Laurillard's *Teaching as a Design Science: Building pedagogical patterns for learning and technology* (2012) and Nancy Hoffman's *Schooling in the Workplace* (Hoffman, 2011). This is coupled with a recognition that any vocational pedagogy has to deal with other contemporary challenges such as changing demands from employers and new qualifications and institutions. There are a growing number of specific attempts to understand e-pedagogy and the role of technology in learning. Robert Cole's (2000) *Issues in Web-Based Pedagogy*, for example, explores the use of the Internet for teaching and research, and issues in distance and virtual education. More recently, *Deconstructing Digital Narratives* (Thomas, 2011), which focuses on the relationship between youth and technology, gives some exploration of how 'digital natives' (those born after 1980) require a new way of teaching and learning involving technology. An enduring issue for many education systems is the vexed issue of functional skills and how best these can be incorporated in any pedagogic framework. Alison Wolf (2011), for example, has pointed out the unintended consequences of the current vocational education system in England which discourages post 16 students from pursuing their English and Maths if they have not achieved GCSE A*-C in these subjects.

Practitioners and researchers brought together by the IfL to consider, among other things, vocational pedagogy, suggested that:

It may be helpful to think not of vocational pedagogy but of a series of overlapping pedagogies for learning, depending on subject area, level, the location of the learning, and the ages of the learners. There is no onesizefitsall approach. There is a strong consensus that effective teaching methods for vocational learning are based on realistic work problems and scenarios, led by teachers and trainers who have recent and relevant vocational experience.

(Harkin, 2012, p. 28)

Finally, we have reanalysed our own earlier work (Claxton, Lucas & Webster, 2010; Lucas *et al.*, 2010; Claxton, Lucas & Spencer, 2012; Lucas, 2010) and the work of the City & Guilds Centre for Skills Development (City & Guilds Centre for Skills Development, 2011; Batterham and Levesley, 2011; Shoesmith and Walker, 2011) in the light of our focus here on vocational pedagogy. As a result of this rethinking, we offer the following reflections as to why we have come so far in the development of vocational education without having developed a reliable vocational pedagogy.

2.4.1 A lack of clarity about the purposes of vocational education

That vocational pedagogy is an under-researched and under-theorised area might, in part, be attributed to the lack of agreement about what it is that vocational education aims to achieve. Since FE became incorporated into mainstream debates about national education policy and economic reform in the early 1990s, FE has experienced a culture shift. Pressures to increase FE provision for the diverse purposes of inclusion, skills development, and economic development led to rapid expansion of FE and, naturally, a lack of clarity about its purpose. Confusion about whether or not FE teaching and learning is improving is inevitable given the yawning gap in knowledge about the pedagogic nature of FE practice and how it is increasingly driven by a 'managerialist, audit and inspection-led policy agenda' (Wahlberg and Gleeson, 2003, p. 425)

Is vocational education a 'deficit approach' to 'training' (rather than 'educating') those considered unsuited to the perceived rigours and status of an academic education (Unwin, 2004)? Is it about meeting the 'skill' requirements of industry (Brockmann, Clarke & Winch, 2006), however narrowly defined such skills might be? Is it about enhancing productivity (Weigel, Mulder & Collins, 2007)? Is it about educating individuals into a 'worthwhile form of life' with a sense of craftsmanship (Corson, 1985)? Or is it about learning as a sense of becoming (Colley, James, Tedder & Diment, 2003, p. 471) rather than as purely the acquisition of 'technical skills and knowledge to foster behavioural competence in the workplace'?

It is more common to find debates about what vocational education is rather than how it should be **taught**. It would appear that until we take a clear view about the desired purposes and outcomes of vocational education, that there will be no solid ground on which to build a pedagogy.

2.4.2 The dual professional identity of vocational practitioners as teachers

The problem is surely intensified by the complexity brought about by the dual professional identity of vocational practitioners as both workers skilled in a particular occupation and as vocational teachers. Such teachers, incidentally were, until recently, not required to undertake teaching qualifications (Lloyd and Payne, 2012, p. 4). In a research seminar held by City & Guilds, Professor Michael Young (2004), informed participants that:

college practice in vocational pedagogy is linked neither to research or progression to higher degrees. This is not a criticism; just a statement of fact. College teachers who take higher degrees rarely tackle the issue of vocational pedagogy because it has not been a high profile research field in universities.

(Young, 2004, p. 3)

There is an unhelpful perception long-held by many FE teachers and managers that vocational expertise is in itself an adequate basis for teaching (Lucas and Unwin, 2009).

As well as this, many FE teachers complete their Initial Teacher Training on the job. They thus have the dual-professional identity associated with being both a teacher, and a trainee themselves (Orr, 2009). Just finding a language and common understanding that can engage both teachers and workers is a challenge.

2.4.3 Inadequate models of vocational education

In an earlier publication for the Edge Foundation, we recommended that a distinct pedagogy for practical and vocational learning should be developed (Lucas *et al.*, 2010). Similarly, City & Guilds' own report on effective vocational teaching and learning (Faraday *et al.*, 2011) picked up on a number of publications concerned that the narrow range of teaching methods used in vocational education reflected a void in vocational pedagogy. In summarising this line of thought, they cited Lucas *et al.*, (2009): 'The most important gaps relate to the naive, incomplete and sometimes doctrinaire models of learning that underpin practical and vocational education.' (Lucas, Claxton & Webster, 2009, cited in Faraday *et al.*, 2011, p. 5).

The dearth of vocational pedagogy is not limited to the UK. In China, where vocational schools are increasingly important to meet socialist ends, Pan Maoyuan (2007, p. 12) writes that 'our pedagogy merely studies issues of general school education ... This is disadvantageous for improving the role of vocational education...'. Not only is vocational education more complex than general education in its linkages to the economy, but it is built on a foundation of general education, and its students are at different stages of physical, mental, and social development from school students.

In Australia, Paul Hager suggests that research about workplace learning pedagogy is shaped heavily by each author's understandings of formal educational pedagogy and that 'such assumptions distort attempts to understand learning at work' (2004, p. 3).

Yrjö Engeström (2009, p. 53) has introduced a notion of learning which he terms 'expansive'. His argument, specifically developed by studying learning in workplaces, is that for much of what we need to learn, there is no acknowledged expert or agreed knowledge. Instead it calls on us to be able to expand our capabilities to better able to cope with the unknown and the changing contexts of work. Knud Illeris (2007, p. 49) offers a typology of learning which allows for different levels of learning and knowledge and which may be helpful in the context of practical learning:

To involve employers in debates about these issues, you have to make it concrete. To sit around tables and talk is ineffective. The only way to get them involved is when they actually see a training programme on the ground and rather than looking at it on paper, they are actually seeing it in action. Then they will have thoughts.

Alison Wolf



- Cumulative learning – delimited, repetition-oriented knowledge is developed that can be used in situations that are the same as the learning situation in a decisive way.
- Assimilative learning – knowledge oriented towards application to a subject (or scheme) is developed and can be used in situations that bring the subject in question to the fore.
- Accommodative learning – understanding- or interpretation-oriented knowledge is developed which can be flexibly applied within a broad range of relevant contexts.

- Transformative learning – personality-integrated knowledge is developed on the basis of which associations can be freely made in all subjectively relevant contexts.

We return to the issue of transfer in more detail in 6.6.

In short, we have inadequate models of vocational education from which to derive vocational pedagogy and where such attempts are made, they often derive from over-simplistic approaches to general education.

We don't want to create something that becomes a fad. We need to make sure that 'vocational pedagogy' doesn't get pigeonholed as the next thing to do and then it's dropped.

There are lots of people who are currently in the vocational training environment who really probably already know most of this, and what we want to do is make sure that those conducting that process of developing learners in the workplace are actually reflecting on their own performance in terms of pedagogy. Are they utilising the most relevant processes to support learners in their learning? This work on vocational pedagogy could help switch on the light to people to learn new processes, or to remember that there are processes that they've used before. That would be very welcome.

Andy Smyth

2.4.4 Poor analogies for vocational education

Historically descriptions of vocational education have tended to be rather imprecise. The mental models or metaphors which have been deployed are often drawn from other areas of learning without clear examination of their appropriateness. So, for example, vocational education has been seen as being:

- Like 'school' but with work experience, or
- Like 'learning to drive' but often without a car (ie the actual equipment ultimately to be used), or
- Like 'sitting by Nellie' but with no real understanding about who Nellie is, whether the ways she is working are good ways and what she might be doing to ensure that vocational education is really happening, or
- Like 'working' but without any remuneration.

While general education and informal learning have, over the years, developed much useful theory which could inform vocational pedagogy, when such thinking is transferred to vocational education it tends to be bolted on rather than fully integrated. So approaches such as problem-based learning may sit side by side with didactic instruction with no apparent justification or thought as to the situations in which one might be chosen in preference to the other.

2.4.5 The reluctance of vocational education teachers to use theory

In *Effective Teaching and Learning in Vocational Education* (Faraday et al., 2011) City & Guilds Centre for Skills Development found that teachers do not tend to make use of teaching models when deciding which teaching strategies to use to respond to particular learning objectives. They concluded that ‘teaching models are not yet established in vocational learning in either the language or as concepts’.

In so far as teachers drew on theory, they cited two as significant approaches – learning styles and experiential learning. Later we show how the evidence for learning styles is not well-founded and, in 5.2, discuss different kinds of experiential learning.

A final reason for the absence of pedagogy analysis and documentation in vocational education may relate to the simple fact that people who are interested in, and value vocational education, may not instinctively see a theoretical activity as a contributor to improving quality. They would much rather try things out in practice, and share experiences with other practitioners via informal networks than design their pedagogy from first principles. One of the long-term goals of our research is to be able to provide vocational educators with a theoretical framework that they see as practical, accessible and fruitful.



2.5 The report at a glance

The flow diagram below summarises the theoretical orientation that has emerged from our reviews of the literature on vocational pedagogy. We do not think that an optimal pedagogy can be designed without reference to a number of important related matters: the most appropriate teaching and learning methods can only be specified after a number of other issues have been considered.

- 1 You need to have a very precise specification of the outcomes of vocational learning that are being sought. You cannot know how best to teach until you know clearly what you are teaching for.
- 2 The way you teach must depend on an appreciation of the intrinsic demands and constraints of the particular domain you are working in. A job that predominantly involves working with people – being a nursery nurse, for example – will require a different balance of teaching methods and learning experiences than a job that involves mainly solitary hours looking at a screen – being a graphic designer or a software developer, for example.
- 3 You need a broad appreciation of what learning methods are available to your learners. Only if you have a full ‘palette’ of learning processes can you begin to know what kinds of experiences will harness the most appropriate learning for each desired outcome. Pedagogy is successful to the extent that it recruits the right cognitive processes from the learners.



4 You need to know your learners, and the particular learning skills, attitudes, beliefs and barriers they bring with them. One learner might have had a successful school career that has left them with an over-reliance on intellectual ways of learning that do not work so well in a vocational context. Another may have emerged from their schooling with a passive and defeatist attitude to any kind of learning that reminds them even faintly of 'school'.

5 You need to know what the resources, affordance and constraints are of the vocational education environments and settings in which vocational pedagogy is going to take place. An industrial workshop invites different kinds of learning from a college lecture hall – and it is an empirical question which works best for whom.

Only when you have answered all these issues can you begin to consider what an optimal pedagogy will look like. Any attempt to short-circuit this thinking process, we believe, is likely to result in a sub-optimal learning experience for vocational learners, and thus to compromise the achievement of the desired outcomes. We think this short-circuiting has accounted for much of the concern about lack of engagement, lack of retention and lack of achievement in vocational education to date.

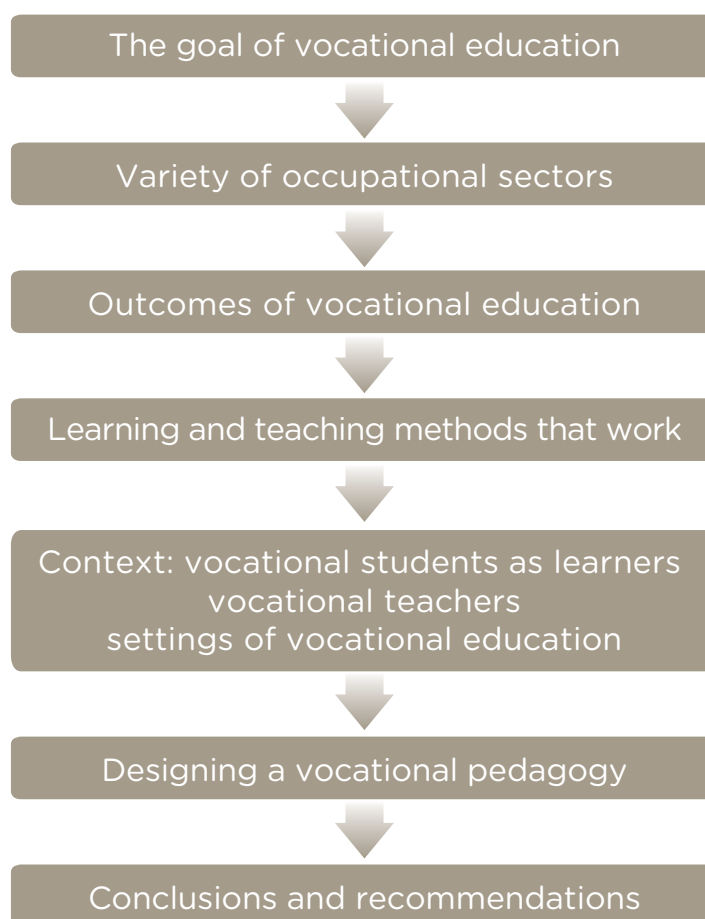


Figure 1 Report overview

3

The goal of vocational education in all its variety



3.1 Purpose of this chapter

Here we argue that without clarity about the overarching goal of vocational education it is impossible to develop a valid pedagogy. In order to create a vocational pedagogy, a number of questions arise which must first be considered. These relate to the nature and purpose of vocational education itself. There is no such thing as ‘good pedagogy’ or ‘best practice’ in the abstract. The concept of good teaching and what it might look like makes sense only if we have already specified **‘teaching for what?’**. We need to know what the goal is before we can begin to think about what the resulting ‘desired outcomes’ of vocational pedagogy might be, and how to achieve them. ‘What’s the best route to take?’ makes sense only if we know where we are trying to get to.

Here, we begin by first identifying, and attempting to categorise, the huge variety within vocational education. By classifying the different types of vocational education according to the degree with which they deal with, whether physical materials, people, or symbols, we are able to show how the desired outcomes of vocational education are relevant across all vocations.

This chapter proceeds with an exploration of the idea of ‘working competence’: in other words, what we believe to be the main practical goal of vocational education.

Before we can develop any theoretical framework for vocational pedagogy we need to understand:

- 1 Whether it is helpful to distinguish different groups or kinds of vocational education and the domains which they encompass.
- 2 What is distinctive about the goal of vocational education.
- 3 What the generic ‘desirable outcomes’ of vocational education are – the skills, sensibilities, working knowledge, care and understanding of tools and resources, wider skills/dispositions for lifelong learning and orientation for excellence – for which vocational education ought to aim.

Here we tackle the first two questions, turning to the third in chapter 4.

How do you design a curriculum that engages people so they want to be curious, they actually want to learn, and they are curious enough to be resilient enough to survive both the financial and academic rigor that is required?

Sally Dicketts

3.2 The huge variety of vocational education

In England, vocational education (VE) is spectacularly varied and involves a bewildering range of routes. In an earlier CRL report for Edge (Lucas *et al.*, 2010, p. 7) we sought to map practical and vocational education provision in the UK. The vocational education terrain is never static. So, for example, a new qualification – the 14-19 Diploma – was introduced in September 2008 (Hodgson and Spours, 2010). At that time, under the 14-19 Reforms in England, young people could opt to follow qualifications along one of four pathways, including Apprenticeships, Foundation learning (qualifications below Level 2), Diplomas, or GCSEs/A levels. The Wolf Review (2011) makes a number of significant recommendations for simplifying the qualifications system, many of which are in the process of being implemented.

But since the election of the Coalition Government in the UK in 2010, in England, Diplomas have fallen off the agenda while there is a renewed appetite for the development of apprenticeships. The general educational landscape has changed, too, with the introduction of Studio Schools and University Technical Colleges¹⁰ specifically encouraging new approaches to vocational education. Within secondary education, the majority of schools are now academies, some of which have chosen to focus on aspects of vocational education.

Vocational subjects are distinct from academic subjects in a number of ways, each of which raises its own concerns for the organisation, teaching, and assessment of such subjects. According to Michael Young, vocational subjects also vary among themselves in terms of:

- 1 *The balance between subject content knowledge and workplace procedural knowledge. This impacts upon where most of the teaching is done. Some vocations are more conducive than others to learning on the job.*
- 2 *The degree to which the subject is established and has an agreed body of content or workplace procedural knowledge, or professional body. Some vocations are more recently established than others and have fewer sources of expertise.*
- 3 *The extent to which a competence or outcomes approach is appropriate for assessing both vocational skills and knowledge.*
- 4 *The relative value assigned to generic pedagogic skills that are common across different vocational areas, and the ease with which those can be translated into a curriculum.*
- 5 *The balance between general pedagogy and specific vocational pedagogy in training programmes where continuing general education continues to be important.*

(Young, 2004, p. 3).

¹⁰ Studio Schools are linked together by the Studio Schools Trust, a joint venture between the Young Foundation and Edge that works closely with the DfE and other organisations. Its website can be found at: <http://studioschoolstrust.org/> University Technical Colleges are developed as Academies under the Free Schools Programme. The umbrella website for UTCs can be found at: <http://www.utcolleges.org/>



Given the enormous variety of vocational education, there have been attempts to categorise in order to better understand the content and processes of specific elements. One such way of doing this is to categorise vocations in terms of level of skill and qualification, such as: 'professional', 'technician', 'craftsman', 'skilled', and 'semi-skilled'¹¹, but this does not necessarily assist in taking pedagogical decisions.

Whittington and McLean (2001) use Ivan Illich's seminal work, *Deschooling Society*, as a framework for debating online learning in vocational education. Illich used the term 'learning webs' to comprise four elements that could replace formal educational institutions. While we do not intend to adopt his radical approach, learning webs poses a useful framework for considering the elements one should include within a pedagogy of vocational education:

- 1 Things** – the artefacts the learner needs access to in order to learn.
- 2 People who model skills and values.**
- 3 Peers who challenge, argue, compete, co-operate, and understand.**
- 4 Experienced 'elders'** – offering critique.

¹¹ See <http://www.almanar.jo/AlManarWeb/Default.aspx?tabid=163>. These are the categories used in law to define vocational education in Jordan.

We wonder whether we might helpfully distinguish different kinds of vocational education by emphasising the medium through which the work is expressed.

For example, the three categories we have created in Figure 2 distinguish vocational education that focuses on working with:

- 1 **Physical materials** – for example, bricklaying, plumbing, hairdressing, professional make-up.
- 2 **People** – for example, financial advice, nursing, hospitality, retail, and care industries.
- 3 **Symbols (words, numbers and images)** – for example, accountancy, journalism, software development, graphic design.

The alternative visual representation below suggests that all vocations work with the same three ‘media’, but to different extents. The three-point triangle captures this idea better than the overlapping circles because it suggests that, wherever a vocation is placed within it, it is clear that, to some extent, each of the three aspects is always involved.

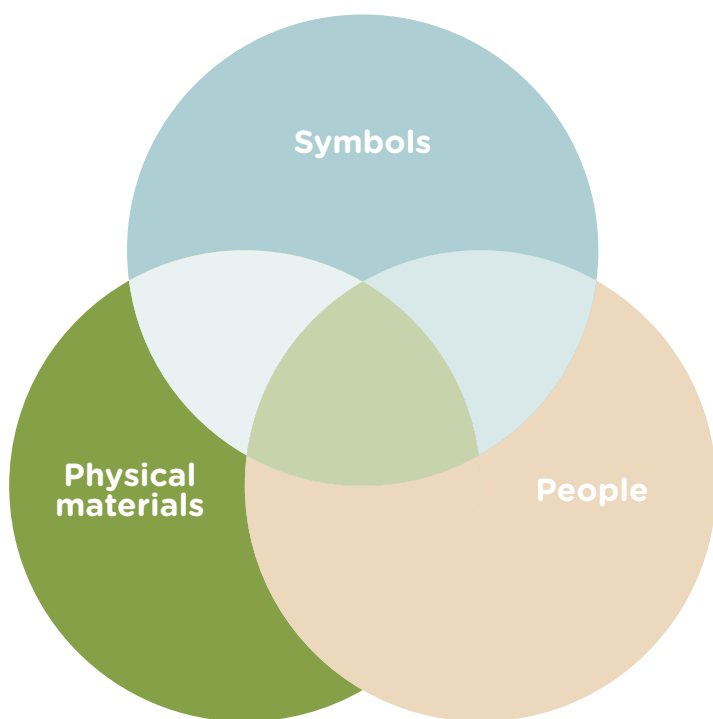


Figure 2 Three aspects of vocational education

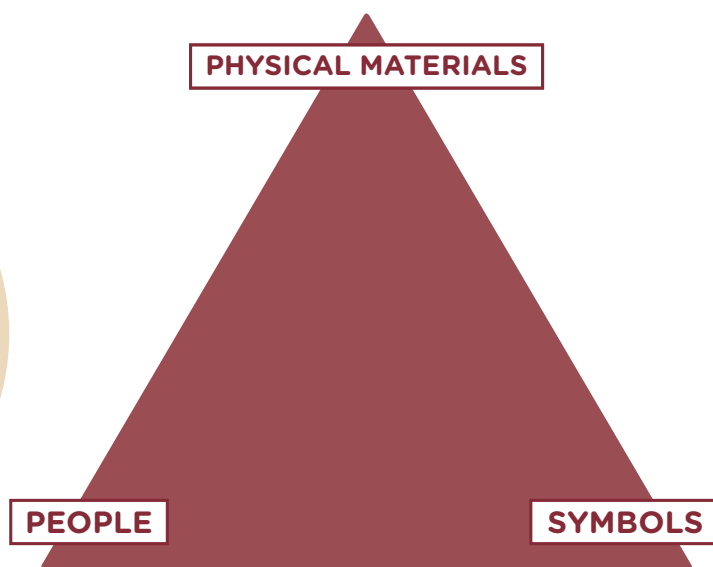


Figure 3 Three aspects of vocational education

It's not so much about categorising; this is a more a useful way of reminding us that most vocations require you to be able to do all of these things. It's a more rounded approach that's required. You may be predominantly a people-kind of business, but you're still having to deal with symbols and materials, and you need to think through what that means for you.

Andy Smyth

While none of these kinds of categorisations adequately capture the complexity involved in different vocations, they may help us 'narrow the odds' in terms of taking the best kinds of pedagogic decisions. So, for example, we can make some generalisations about learning methods which work best:

- 1 **Physical materials** – for example, imitating, practising, trial and error as part of real-world problem-solving.
- 2 **People** – for example, feedback, conversation, simulation, especially including role play.
- 3 **Symbols (words, numbers and images)** – for example, learning through thinking critically, and via virtual environments.

It is our hope that vocational teachers might find the conceptualisations in Figures 3 and 4 of practical use as they design vocational courses and activities. For example, the figures might be used as a prompt to check that they are 'covering all the bases', remembering to include the 'people' aspects of working with 'symbols' such as in accountancy, or the 'physical materials' involved in sports science or the 'symbol' aspects of rates of gas flow and condensation in a modern gas boiler. The same methods may, of course, work well in different contexts.

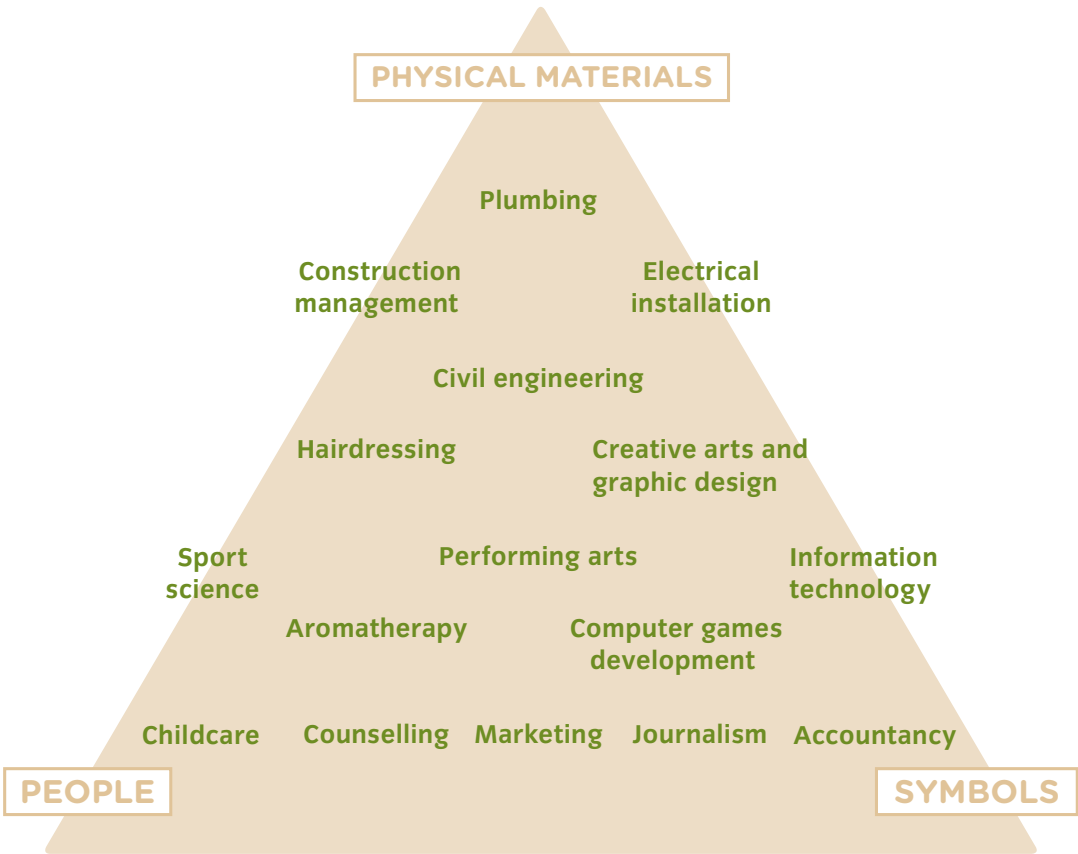


Figure 4 Common FE courses mapped against 'materials', 'people', and 'symbols' framework

3.3 Working competence, expertise and being able to do skilful things

The overarching goal of vocational education is, we believe, the development of working competence in a chosen vocational area. Put another way, vocational education is about enabling people to learn how to do things to a standard set by experts from the occupation into which they are progressing. The primary outcome of vocational education is expertise – being able to do skilful things of a kind and in an area of work that is quite clearly specified and understood. This distinguishes vocational education from more academic forms of education where the valued goal (as defined de facto by most forms of assessment) is to be able to write and talk about something; to be able to explain, critique, theorise and justify.

But competence is a much misunderstood word and here we explore some of the issues associated with it.

One important dilemma in understanding the development of practical knowledge is highlighted by Howard Gardner:

Some people seem, as a matter of temperament, to like understanding and being able to explain what they are doing. They find that thinking – putting things into words – helps them learn. Others, however, seem to be able to pick up physical expertise without doing this kind of thinking much, and without being able to explain what they are doing. They ‘think in the medium’, as it were, rather than in words or abstract concepts. Unless they are called upon to do so – if they are trying to coach or correct someone else, for example – this does not seem to be a handicap. To some extent, whether you learn with or without ‘lexicalising’ seems to be a matter of preference.

(Gardner, quoted in Lucas et al., 2010, p. 30)

If you go into a workplace, a mentor or coach is absolutely clear about what they are teaching someone to do. It might be a craft or technique, like filleting a fish for example. But if you go into a class in a college and ask the class tutor what its purpose was, they would tell you it was about passing the test, passing the module, completing the assignment.

Lorna Fitzjohn

To get better at something or indeed to know if he or she has reached a certain standard, someone will need to be able to describe, probably using criteria expressed in words, what they are doing. But for the apprentice this may not actually be necessary initially. It may not be necessary to verbalise processes as a novice and to do so may be off-putting. As expertise and confidence grows, so does the learner’s ability to notice what is going on in their own work and in the activities of those around them. Of course, from a teaching or coaching perspective it is necessary to be able to describe what is going on. This, we surmise, may be an additional challenge for some of those vocational education teachers who have come into the profession from a predominantly work-based route.

3.3.1 Working competence, but not a checklist of ‘competences’ or skills

During recent decades, the concept of ‘competence’ has been much used in vocational education. Noting that definitions vary, Martin Mulder and colleagues (2007) define competence as: ‘the capability to perform and to use knowledge, skills and attitudes that are integrated in the professional repertoire of the individual’ (*ibid.*, p. 82). They argue that the use of ‘competence’ is widespread because of its popularity both within and beyond the European Union. Competence aligns with notions of ‘self-managed learning’, ‘authentic learning’ and ‘knowledge construction’ and is similarly concerned with the meaningful objectives and content of learning that will engender the personal development of students and position them within the domain of knowledge that can best prepare them to function effectively in society (Mulder, Weigel & Collins 2007, p. 68).

There are three contrasting approaches to competence: the ‘behaviourist’ (determining which observable behavioural characteristics separate out successful job performers from their less successful counterparts); ‘the ‘generic’ (identifying common abilities that explain variation in performance irrespective of profession); and the ‘cognitive’ (identifying mental resources used to master tasks, gain knowledge, and perform successfully).

In suggesting that the overriding goal of vocational education is ‘working competence’, we do not deny for a moment that there is a good deal of knowledge and explanation involved in the skilful exercise of any vocation – there clearly is. But ‘knowing’ and ‘thinking’ are in the context of – and in the service

of – practical expertise. The evidence of success is the working washing machine, the satisfied customer, the smooth putting green, and not the ability to be a pundit about such things. Thus, as we will see, ‘knowing’ and ‘thinking’, in the context of vocational education, have to be taught in such a way that they readily come to mind, and are useful, in practical situations. This makes vocational pedagogy significantly different from academic pedagogy, but no less sophisticated.

It is critical; however, that working competence is about the ability to make good decisions in a real situation, at a specific moment in time, and not about checking off a list of specific, task-based competencies. It is also imperative that working competence is relevant and current.

We believe that formal qualifications are necessary to benchmark standards and assure quality. But qualifications can be misused. Whittington and McLean (2001, p. 156) write: ‘what an individual knows, understands and can do are much more important than how and where these capabilities were developed’ and yet ‘many professional educators place the provision of courses and certification of successful completion at the heart of their work’ (*ibid.*, p. 157). Arguably such a situation is the fault of the system not of qualifications themselves.

In summarising the major critiques of the competence approach in England, Mulder *et al.* (2007) suggest that the competence concept is too often used to reduce what is valued down to an assessable ability to demonstrate skills and abilities successfully. They claim that emphasis on competence ‘frustrates learning and development more than supports it’ (*ibid.*, p. 77). In addition, the relationships

between competence and other concepts such as performance, knowledge, the curriculum, instruction, assessment, and organisation, are not straightforward.

Hyland (2006) talks of the 'damage wreaked' by competence-based education. He makes a case for competence-based approaches overly determining behaviours, deskilling individuals, downgrading the value of vocational studies, and reducing vocational education to a utilitarian experience.

Using the example of the daily work of motel reception staff, Stevenson (2005) suggests that:

It is a mistake to believe that knowledge as represented by the ascribed [competency] label exists, that it is generic or that it is directly transferable. That is, it is a big leap to thinking that a person 'has data manipulation knowledge' because that person can use software in a particular motel computing system ... It is an even bigger leap to think that the capacities that are involved ... can be used directly in another motel ... It is also a step too far to think that the competent front office motel worker would recognise their own capacities in the [competency labels] used...
(Stevenson, 2005, p. 339)

It is also important that we do not fall into the trap of promoting the prescriptive learning outcomes and 'skills' of some competence-based education. It's a balance. We want flexible, integrated, thoughtful skills but not atomised checklists of micro-competences. Mastery of a 'generic' or 'core' skill in one context does not by any means suggest it will translate into its mastery in a new context
(Hager, 2004, p. 429).

Hyland (2006) argues that the dominance of competence-based educational goals is highly damaging, bringing with it the radical deskilling of countless occupations, the downgrading of vocational studies, and the rise to prominence of a perversely utilitarian and unduly economic conception of the educational enterprise in general.
(Hyland, 2006, p. 302)

Where competence is the focus, it is assessed outcomes, rather than the learning process, that can easily become the focus. For example, Tajna Weigel *et al.* (2007) note that, according to the creator of the NVQ:

a necessary characteristic of qualifications ... is that they allow free access to assessment; meaning that assessment is independent of the learning process ... Therefore an essential facet of the NVQs is that they are defined in terms of outcomes, demonstration and assessment rather than in terms of the learning process leading to them.
(Weigel *et al.*, 2007, p. 55)

The NVQ framework – driven by the objective of improving productivity – incorporates five levels specifying the level of competence required:

From

Level 1 Competence that involves the application of knowledge and skills in the performance of a range of varied work activities

to

Level 5 Competence that involves the application of skills and a significant range of fundamental principles across a wide and often unpredictable variety of contexts.

However, our understanding of ‘working competence’ needs to go beyond the idea of competence as ‘a description of something which a person who works in a given occupational area should be able to do’ (Weigel *et al.*, 2007, p. 55) to incorporate expertise, cognition, resourcefulness, commercial sense, and craftsmanship. These are areas of ‘desired outcome’, to which we return in chapter 4. It is vitally important, therefore, that qualifications are used to support improvement in the sector, and that they exist in harmony with the notion of ‘working competence’.

3.3.2 Competence that meets the real needs of employers

You do not need to talk to many employers to hear complaints that their workforce does not have the right skills. For example, the Construction Industry Trade Survey of 2011 continued to report difficulties experienced by construction firms in recruiting, with carpentry being a notable example (Abdel-Wahab, 2012). The UK Commission for Employment and Skills (UKCES) recently published the initial findings of its skills survey of UK employers, which showed that 5% of all employees are not considered to be fully proficient at their job. Further, some 16% of all vacancies are hard to fill because of skills shortages among applicants. UKCES found that vacancies related to skill shortages were ‘particularly prevalent’ amongst Skilled Trade¹² occupations.

¹² Occupations were classified as ‘skilled trade’; managers; professionals; associate professionals; administrative/clerical; caring, leisure and other services; sales and customer services; machine operatives; and elementary staff.

That vocational education should be relevant to the real needs of employers is thus a very reasonable aspiration. An important aspect of any vocational pedagogy will be, therefore, scope for updating content and approaches based on the current (and future) needs of potential employers.

In England a number of bodies seek to ensure employers are able to influence the content of vocational education to match it to their needs so that vocational education is relevant. These include the UKCES, a Non-Departmental Public Body providing strategic leadership on skills and employment issues, and a number of Sector Skills Councils (SSCs). In addition there are awarding bodies, such as City & Guilds, who contribute to the content of vocational education.

Individual occupational sectors do not always find it easy to identify exact training requirements. The construction industry is a case in point because, in trying to consolidate employers’ views, its SSCs ended up with a view of employers that was overly simplistic and ignored their industry’s complexities (Abdel-Wahab, 2012, p. 149). Thus, over-reliance on employers and on those organisations which represent their views would clearly be unhelpful.

The NVQ system provides another example of this difficulty. Brockman *et al.*, suggest that by defining learning outcomes in terms of employers’ narrow sets of skill needs, the NVQ system has become ‘disconnected from curricula and teaching’ (Brockmann *et al.*, 2006, p. 561).

High quality systems tend to grow quite organically, which is not very conducive to rapid, top down, ‘do it this way’ orders. I think that’s been one of the major problems with vocational education in this country. Since the early 1990s governments have tried to put employers in the driving seat by setting up another committee. Then two years later employers say ‘we have nothing to do with it, we don’t own it’. How do you actually change the warp and the weft of vocational provision in such a way that employers are much more involved? They need to be involved because they are the labour market; they are the economy.

Alison Wolf

Further, ideas about what constitute ‘competence’ affect the usefulness of a qualification. Brockmann *et al.*, argue that the primary weakness of the English system is its ‘skills-based’ approach, which lacks a developed notion of citizenship, of broad competence development and of occupational identity; neglects general education and also personal development. In contrast, vocational education and training in the Netherlands and Germany takes a ‘knowledge-based’ approach, where content is high in theoretical input (valuing both tacit and explicit forms of knowledge), and ideas of personal development and civic education. ‘Competence’, in these countries, is seen as a multi-dimensional concept, whereby individuals integrate theory and practice, bring together resources, and apply the ‘whole person’ by reflecting on a given work situation, and upon their own actions: ‘students and workers thus become producers of knowledge, central to the success of knowledge-based labour processes’. Unlike in the English context, ‘employability’ is not solely focused on the interests of employers-at-large (Brockman *et al.*, 2006, p. 562).

3.4 Vocational education as ‘education for work’

It will also be important to consider the degree to which vocational education is focused on the needs of specific vocations, or even on the notion of work itself (as opposed to life outside work). In his 1985 paper attempting to draw up a theory of vocational education, Corson made an important distinction between vocational education as ‘education for work’, and as ‘training for work’. If seen as ‘training’, vocational education could simply be removed from the institution of education altogether, and the job of ‘training’ given to employers. Vocational education thus includes ‘training for work’ but is more than just training. According to Corson (1985, p. 291):

Being educated demands more than being highly trained; it involves the possession of a body of knowledge along with a conceptual scheme to raise that body of knowledge above the level of a collection of disjointed facts.

(Corson, 1985, p. 291)

Corson is right. But in the wrong hands this argument can be used to justify inserting undigested chunks of academic theory. Education in a general sense is about being initiated into a worthwhile form of life, and it usually presupposes training as a necessary aspect: 'hence we can usually say that training is part of the experience of an educated person', but although we can train for a job, we can never educate for it' (*ibid.* emphasis ours). The role of the vocational educator is much more than has been demanded historically:

The caricature of 'trainers for work' as unreflective overseers, pushing students through the slow and plodding rote learning of apprenticeships, is inconsistent with the meaning of education in the specific sense. Such a curriculum of training fails in two ways: its graduates emerge from their training uninitiated into the meaning of work as a component of a worthwhile form of life; and the trainers, by failing to apply in their work any insights into the specific meaning of education, are themselves engaged in a form of work which lacks the meaning it could have, thus effectively reinforcing by their own example the inadequate meaning of work their trainees are extracting from their training.

(Corson, 1985, p. 294)

A view of vocational work that has 'education' as its aim would be more likely to develop workers 'who love their labour for its own sake, this preparation would produce graduates who view their work as craftsmen view theirs' (*ibid.*, p. 295. emphasis ours). Similarly, Christopher Winch (2004) writes:

We want work to be worthwhile, not just in the rewards that it brings us, but also in the intrinsic satisfaction that comes from doing something that we think is valuable. If we spend our time working on producing goods and services that we think are of good quality, if the work requires a high degree of skill, responsibility, social interaction, trust and autonomy then we are more inclined to regard it as intrinsically worthwhile than if it lacks these attributes.

(Winch, 2004, p. 78)

Corson describes six features of craftsmanship that he suggests could be used as discussion points around which vocational curricula could be developed in order to reinforce the value that vocational students see in their work for society:

- 1 There is no ulterior motive in work other than the product being made and the process of its creation.
- 2 The details of daily work are meaningful because they are not detached in the minds of workers from the product of their work.
- 3 Workers are free to control their own working action.
- 4 Craftsmen are thus able to learn from their work and to use and develop their capacities and skills in its prosecution.
- 5 There is no split of work and play or work and culture.
- 6 The work activity of craftsmen determines and infuses their entire mode of living (Corson, 1985, p. 295).

VE tends to be seen as the ‘poorer cousin’ of academic education. This is largely as a result of the historical development of the education system, the purpose of which, as Sir Ken Robinson has mischievously suggested, ‘throughout the world is to produce university professors’ (Robinson, 2006). It is also, however, contingent upon naive assumptions about what it means to be intelligent. In *Bodies of Knowledge* (Claxton *et al.*, 2010) we set out to discredit eight ‘myths’ about practical and vocational education.

These eight myths, recognised as such, give the lie to any notion that vocational learning is not a complex, intelligent activity in which more than just the brain is engaged:

- Myth 1:** Practical learning is cognitively simple.
- Myth 2:** Clever people ‘grow out’ of practical learning.
- Myth 3:** You have to understand something before you can (learn how) to do it.
- Myth 4:** Clever people don’t get their hands dirty.
- Myth 5:** Clever people don’t ‘need’ to work with their hands.
- Myth 6:** Practical education is only for the less ‘able’.
- Myth 7:** Practical learning involves only lower order thinking.
- Myth 8:** Practical teaching is a second-rate activity.

Our view is that qualifications are most useful when they are directly linked to the development, as well as the expression, of working competence. In *Does Education Matter*, Alison Wolf’s (2002) critique of education as an economic panacea, the author cites Ewart Keep’s argument that policymakers treat qualifications as though they are simply a way for young people to access a more ‘advanced’ level of education, rather than as though they have specific relevance to the workplace. Some have sought to integrate vocational education within a more general education. For example, Lewis argues for:

a unitary curriculum, one that is not hierarchically ordered, and that is devoid of tracks. All students would have equal chances of engaging in a breadth of studies supportive of wide-ranging vocational insight. All would pursue academic subjects; all would learn about the world of work.

(Lewis, 1998, p. 283)

And yet we would argue that while this might be a desirable goal, if vocational education does not develop learners who are fit for the workplaces in which they aspire to work, the problem is not solved.

How vocational education does this is not through the system at large that focuses on programmes, assessment and certification. John Hattie’s large-scale meta-analysis (2009) compared over 800 studies that cited a large range of factors thought to influence attainment. His study showed that the key (in this case, to attainment) is what happens at the ‘learner end’, through the day-by-day reflective, pedagogic decisions teachers make that develop learners into their own coaches and teachers.

4

The intended outcomes of vocational education



4.1 Purpose of this chapter

In addition to an overarching goal, in developing a vocational pedagogy, we need to examine the desired outcomes vocational education seeks to create, the components of what we called working competence in the last chapter.

Here we build on our exploration of the overall goal of vocational education in chapter 2. We suggest that six outcomes are important in all vocational education, and begin to consider what implications there are for vocational pedagogy in the light of our earlier suggestion that there are three very different ‘kinds’ of vocational education – working with practical materials, working with people and working with abstract concepts.

Specifically, we focus on the non-routine aspects of vocational education (what we are calling resourcefulness), and on the development of craftsmanship, business-like attitudes and wider skills for growth, necessary for a lifetime of learning and employability. We also consider how best functional literacies can be acquired in vocational learners.

4.2 What are the generic outcomes for which vocational education ought to aim?

Cedefop explores learning outcomes in their (2008) publication, noting the shift from content-led curriculum to a learning outcomes approach. They develop the argument that ‘adopting learning outcomes is an important part of the diverse framework for success – at whatever level is in question – in European education and training systems’ (p. 42).

Taking a learning outcomes approach, in the Nuffield research (Pring *et al.*, 2009) into the future of education and training for 14-19 year olds, the authors speculate about what counts as an educated 19 year old today. Unsurprisingly, they could not agree! But their statement of intent suggests that our imaginary 19 year old young adult would have been introduced to:

a form of life which is distinctively human, which enables them to live independent economic lives, and which enables them to participate positively within the wider community...

(Pring *et al.*, 2009, p. 13)

In a parallel study, Ann Hodgson and Ken Spours (2010, p. 2) asked headteachers from more than 250 independent schools in the UK the same question, and found that school leaders wanted to develop ‘rounded individuals, capable not only of gaining access to a university of their choice and to fulfilling and rewarding work, but also of making a wider contribution to society’. This was summed up as ‘creative, critical, caring and collaborative young people’.

An imaginary 19 year old is a useful figure to hold in our minds. Adult, yet not completely adult, whatever outcomes we specify for vocational education which we then incorporate into our vocational pedagogy it will be important to know that, had he or she progressed through the English vocational education route, we would be happy with the outcome.

Traditionally, vocational education outcomes are framed in terms of skills or competencies relating to particular vocational domains with, recently, a greater interest in basic skills (in literacy, numeracy and IT for example), and also in what are increasingly referred to as 21st century or wider skills (Lucas and Claxton, 2009).

But this is simply not good enough. We argue that there are, broadly, a number of capabilities that go to make up the working competence of a vocational worker, and these add to – rather than being a different set from – the set of capabilities required of an ‘academic’ worker. We realise that vocations differ widely amongst themselves, and aim to bring order to these differences here.

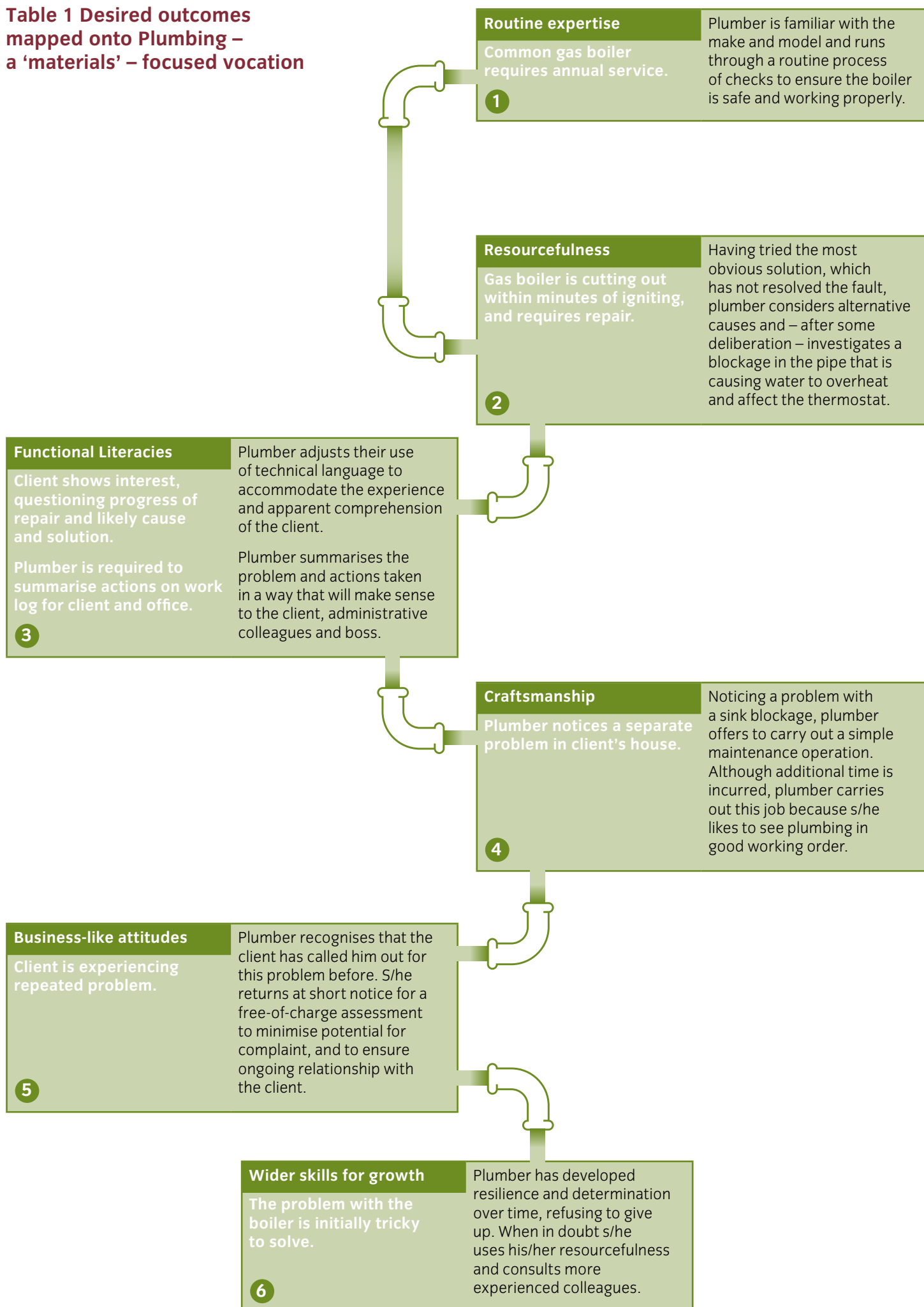
In attempting to theorise about the role of knowledge and its contribution to decision-making (and dealing with the non-routine, with troubleshooting, and with all the many unexpected situations which learners encounter in the real world of work contexts) we offer a very broad specification of the kinds of capabilities we argue should be central to vocational education in the 21st century. Six outcomes are critical to understanding working competence. We call these:

- 1 Routine expertise (being skilful).
- 2 Resourcefulness (stopping to think to deal with the non-routine).
- 3 Functional literacies (communication, and the functional skills of literacy, numeracy, and ICT).
- 4 Craftmanship (vocational sensibility; aspiration to do a good job; pride in a job well done).
- 5 Business-like attitudes (commercial or entrepreneurial sense – financial or social).
- 6 Wider skills for growth (for employability and lifelong learning).

In table 1, we put the six outcomes into context by exploring an example. The example on the next page is that of a plumber fixing a boiler.



Table 1 Desired outcomes mapped onto Plumbing – a ‘materials’ – focused vocation



4.2.1 Routine expertise

This is at the core of working competence. It involves skilled routines and the ability to carry out skilful activities to a satisfactory standard. It relates to the use of materials, tools and abstract concepts:

1 'Material'. This includes a sensibility to the properties, behaviour and affordances of the 'material' that is focal to the vocational domain – double cream, a plank of walnut, a graphics package, a young adult with learning difficulties.

2 Tools. We would include here an understanding of the range and nature of appropriate tools, and an attitude of intelligent care towards the selection, use, customisation and maintenance of such tools.

3 Abstract concepts. Conceptual knowledge required for performance in the workplace is often opaque to the uninitiated. Where workers are at a distance from physical tools and interactions – perhaps where they are masked by technology – understanding becomes abstracted and remote.

Acquiring any kind of practical expertise requires time and practice. Anders Ericsson has suggested that typically it takes 10,000 hours to become an expert (Ericsson, Krampe & Tesch-Römer, 1993).

A default position for developing routine expertise would be that a teacher needs to get attention, explain, demonstrate, set an engaging task, give learners the chance to practise and provide multiple opportunities for feedback, questioning and reflection.

Routine expertise tends to be developed by, for example, watching, imitating, through careful and regular practising, via feedback from experts and peers and by being coached¹³. Once routine expertise is established, it is often very hard for the learner to articulate what it is they are doing.

You can be intelligent practically without being able to state propositionally what the standards are, and what the particular skills are to what you're doing. So for example, a person may be able to ride a bicycle with great skill, balance and all that kind of thing, but possibly wouldn't be able to give a propositional account of what he or she is doing when they are riding skilfully.

Richard Pring

A lot of people on the continent, in Poland and Germany and so on, have as part of their vocational preparation a broader educational understanding of the principles that underpin the work that they are doing. This makes them more flexible; more adaptable to changing circumstances.

Richard Pring

¹³ See 5.2 for a much fuller exploration of different vocational learning methods.

4.2.2 Resourcefulness

Sometimes we need to stop and think. We encounter something which is not routine and need to be able to respond accordingly. Sometimes this will be because our knowledge is so embedded that we can somehow access it when we need it, even if only occasionally. At other times we need to stop, look around us and see who or what might be able to help us out of our tight spot. 'Who' might be a skilled colleague. 'What' might be a helpful tool or procedure.

Beyond the familiar and routines, expert practitioners are able to bring to mind knowledge that is applicable to new and unfamiliar contexts. In the vocational context, the prime function of 'knowledge' – theory, formulae, maxims, rules of thumb, and heuristics – is to enable appropriate thinking, decision-making, and performance, in non-routine situations. Heuristics, or 'tricks of the trade' are procedures that have evolved over time through practice. Knowledge of them provides learners with effective tools for successful performance in the workplace, particularly when abstract concepts seem incomprehensible (Billett, 2000). While a solid knowledge base is important, however, knowledge alone is insufficient for employability, and individuals need to be able to apply it in specific contexts (Weigel *et al.*, 2007).

The skilled practitioner needs to be able to identify situations that may not be immediately susceptible to familiar routines, and to bring to bear knowledge that will enable them to construct a non-routine way forward that will eventually lead to a satisfactory solution. Clearly vocational pedagogy will need to ensure not only comprehension and test-use

of information, but also its retrieval and deployment in the context of real-time, real-world predicaments. Retrieval and manipulation of appropriate knowledge must become triggered by real features of these predicaments, not by an out-of-context request for 'demonstration'.

The relationship between knowledge and expertise is complex. Questions arise such as:

- How much explicit knowledge does a learner need in order to be able to perform a task?
- How much of the necessary knowledge will they acquire 'on the job'?
- What is the role of theory, frameworks, and models in learning?
- How and when should theory be best introduced so that it comes to mind when needed?

The thing that always strikes me about vocational subjects like music and sport is the absolute perfectionism of the teachers. Good teachers of music are utterly disinterested in it being 'good enough'. There's a really brutal minimum and an assumption that all learners will reach it. That's very different from academic subjects. Good vocational teachers don't have low expectations; they don't do low expectations.

Alison Wolf

Learners need to be able to apply knowledge in a range of situations which do not closely replicate those already encountered in training. This problem has sometimes been theorized in binary terms as a question of knowledge being acquired 'just-in-time' versus 'just-in-case'. Just-in-time might occur when an expert demonstration is given just before something is attempted for the first time. Just-in-case might occur when a formula, such as Ohm's Law, is learned with a view to its future usefulness to the trainee electrician.

Alison Fuller and Lorna Unwin (2008) suggest that, from a pedagogical perspective, apprentices need more than just the workplace. They also need space for reflection and access to formal instruction if theory and practices are to be effectively learned.

It seems to me that the really good practical person engaged with their craft intelligently would be rather appalled by shoddy work, not because it might mean less money or less bonus, but because it offends them to see something done shoddily.

Richard Pring

While some of the resources the practitioner will need are cognitive or 'on-board', these are continually supplemented by external resources which enable the practitioner's distributed cognition – the need to check with clients, suppliers, manufacturers, mentors and mates; or to consult trade catalogues, online websites, sketches and plans. The vocational learner needs to learn what these are, where to go for what kind of help, and how to communicate effectively both technically, to people in the same 'trade' and non-technically to customers, clients and members of allied trades and professions.

The social element of learning has been explored and confirmed by empirical research. Using Lave and Wenger's concept of 'legitimate peripheral participation' (which concerns the way in which newcomers develop the skills and values that enable them to become 'insiders'), Hyland (2006) claims that work-based learning:

– in addition to fostering the occupational knowledge and skills that make up 'economic' capital – can, through workplace practice, also facilitate the development of the valuable 'social' capital which is located in the kinds of contexts and culture that promote communication and mutual learning as part of the fabric of everyday life.
(Hyland, 2006, p. 304)

Resourcefulness tends to be learned through extensive practice in a range of contexts. It can be promoted by problem-solving, through enquiry-based learning, by being coached in the moment, using virtual environments and through simulation and role play.

4.2.3 Craftsmanship

A relatively recent development has been a number of more subtle attempts to understand the cultural aspects of being a skilled 'craftsman'. Mike Rose's *The Mind at Work* (2005), Richard Sennett's *The Craftsman* (2008) and Matthew Crawford's *The Case for Working with Your Hands* (2010) are good examples. Craftsmanship is about the pleasure, pride and patience involved in doing a 'good job'.

Crawford (2009) sums up this the idea of 'craftsmanship':

As you learn, your trade ... takes its place in a larger picture that is emerging, a picture of what it means to be a good plumber or a good mechanic ... Your sense that your judgments are becoming truer ... is a feeling of joining a world that is independent of yourself, with the help of another who is further along.

(Crawford, 2009, p. 207)

In a school and college context, Ron Berger (2003) has explicitly explored ways in which different pedagogical approaches tend to cultivate an 'ethic of excellence'. Berger also highlights three ways in which an ethic of craftsmanship can be promoted:

- 1 Using positive peer pressure to develop a cultivating and positive culture built around a pride in 'beautiful student work' and by pairing more advanced students with those just embarking on their learning.
- 2 By recognising that self-esteem grows from 'accomplishments not compliments' and can be cultivated through 'powerful projects' which fully engage students and also encourage them to make mutual critique.
- 3 Encouraging all teachers to see their profession as a 'calling' and to constantly seek to develop both their 'craft' and their 'scholarship'.

Students who see their work as a 'craft' say of themselves: 'I intend making this work activity part of myself. I am going to live it because while I am doing this work others identify me by it and I measure myself against it'. Corson (1985, p. 296) suggests that work, then, becomes a 'vocation or calling'.

Craftsmanship is learned primarily through prolonged exposure to certain cultures where excellence is constantly sought and where critical reflection is a way of being. Role modelling by vocational teachers is very important as are coaching and mentoring more generally. Watching, imitating, conversation and teaching and helping others are also examples of useful methods. Competing can also play a role when tied to an ethic of high levels of performance.

A vocational subject specialist who is also a specialist in literacy and numeracy is the ideal, but those are very few and far between. Although functional skills are taught more successfully by specialists, as is the vocational craft element, it's absolutely key that the two people work together. Unless there's a link, a lot is lost even if both are superb teachers in their own right.

Lorna Fitzjohn

4.2.4 Functional literacies

We see functional literacies as a slightly broader category than the functional skills of literacy, numeracy and ICT (the low levels of all of which there is currently justified concern in England (Wolf, 2011)). We also include in this essential outcome the general communication and comprehension skills which are essential in vocational education as they are in general education.

There are live debates today about how best to teach these kinds of functional literacies. Some argue for them being embedded in authentic contexts and therefore likely to be taught by vocational teachers. Others suggest that they are better learned from specialists.

In terms of specific methods, it is likely that, if they have not been adequately acquired by the age of 16, some kind of one-to-one intervention may be necessary. Regular corrective feedback is essential. Some learners thrive within well-structured and engaging virtual environments, perhaps using incentives of the kind found in many computer games. Others need simpler practise and repetition coupled with feedback and reflection.



4.2.5 Business-like attitudes

Work may not, of course, be ‘for profit’. Many services, for example in social services and housing and the environment are ‘third sector’ and not run for profit. Nevertheless, an essential outcome from all vocational education is being able to understand and to practise the ‘basics’ of running or being in an organisation providing services or products with budgets and so forth, as well as specific tasks such as marketing, book-keeping, invoicing, and estimating. It also includes ‘softer’ skills, such as being able to converse and communicate with customers and peers in a professional, polite, and effective way.

A business-like attitude would manifest itself in behaviours such as punctuality, orderliness, willingness to put in necessary time and effort, and displays of customer service that exceed client expectation. Ultimately, business sense would include the ability to manage peers, subordinates, and even superiors, and to motivate the team into giving their best for the business and working effectively together.

Some businesses – here we use the example of the Royal Institution of Chartered Surveyors (RICS) and their ‘code of conduct’ – seek to make an explicit connection between business-like and being ethically minded (McClean, 2012). The essential aspects of a professional survey are laid out as a series of imperatives:

- 1 Act honourably.
- 2 Act with integrity.
- 3 Be open and transparent in your dealings.
- 4 Be accountable for all your actions.
- 5 Know and act within your limits.
- 6 Be objective at all times.
- 7 Always treat others with respect.
- 8 Set a good example.
- 9 Have the courage to make a stand.

Every apprentice will have some kind of business objective; whether they be a sole trader trying to earn a living, or whether they are somebody who is part of a multi-national, there is a business objective; you have your purpose.

Andy Smyth

How is it that St. George’s Chapel remains upright for 600 years as tall as it is, with two inches of lead all over that roof? I think a good teacher provokes the young into seeing things which otherwise they wouldn’t see, and asking questions which are related to their self-perception as craftspeople, as stonemasons, and so on. How awful that someone can study engineering at Brunel and never have been excited by the history of engineering and the history of everyday things that great engineers have made. I would think that the story of the people who invented these things; the discovery; the work that went in; would inspire learners to have a much greater sense of their own importance as craftsmen rather than having an inferiority complex because they haven’t got a degree. That ought to be part of that general education of craftspeople.

Richard Pring

As with craftsman-like outcomes, learning to be business-like is hugely influenced by the culture in which the learning takes place and, specifically, by the behaviours modelled of staff and other learners. Watching, imitating, conversation, listening, and teaching and helping others are examples of some useful specific methods. Michael Eraut describes one particular challenge to educational institutions here:

The main problem is that the professionals concerned are urged to adopt practices that involve much greater levels of time and effort than service users and/or the public purse can possibly finance. Hence there is a significant gap between the theories of practice taught by former practitioners, based on how they would have liked to have practised, and the activities performed by current practitioners.

(Eraut, 2004, p. 204)

One of the important outcomes for apprenticeships and other forms of vocational education is for people to develop or further their ability to learn. Another is for them to develop an awareness of when there is a need to learn. For example, in our business: ‘I don’t have the skills to deal with an ash cloud, so I will go and speak to somebody who does’.

Andy Smyth

4.2.6 Wider skills for growth

As the end of the 20th century approached, one of the most pressing questions of education related to the sorts of competencies the 21st century would demand. Viveca Lindberg (2003) writes that while specific competencies were then, and still remain, hard to predict because of changes in society and technical development, many claim that young people need to be prepared for a changing society and for structural changes in the labour market. For vocational education, whose aim is to prepare young people for future labour markets, this issue remains critical.

In a report for the National Endowment for Science, Technology and the Arts, Bill Lucas and Guy Claxton (Lucas and Claxton, 2009) identified a wide range of approaches to wider skills adopted across the world by national and state education departments, research institutions, third sector organisations, and commercial organisations. The sorts of ‘wider skills’ deemed important are many and varied, and are described variously as ‘broader skills’, ‘competencies’, ‘dispositions’, ‘capabilities’, and ‘habits of mind’. Employers regularly call for employees with wider skills such as problem-solving, team-working, resilience, entrepreneurialism etc in addition to high-level functional skills and technical expertise.

Methods which require learners to take responsibility for their own learning are likely to work well here, such as: practising, feedback, teaching and helping others, real-world problem-solving, enquiry, learning on the fly, being coached and various kinds of simulation and role play.

4.3 Mapping desired outcomes onto the three 'kinds' of vocational education

Different kinds of vocational education call on different approaches. For simplicity's sake in chapter 3, we suggested clustering the vocations into three groups, according to their central focus:

- 1 One group has a focus on working with certain kinds of **physical materials**: wood, pipes, electrical wire and fittings, foodstuffs, hair, etc.
- 2 The second group has a predominantly **people** focus, involving working with people: the elderly, small children, adults with learning difficulties, students of many kinds including musical and sports.
- 3 The third group work predominantly with **symbols**: words, numbers, text, accounts, spreadsheets, digital software, etc.

While these groupings are necessarily overly clear-cut we think they begin to help us to make sense of the kinds of pedagogies that can be appropriate in different vocational domains.

In Table 1, we explored the way each of the six vocational desired outcomes could be relevant for plumbers, as individuals working predominantly with physical materials. Table 2 and Table 3 repeat the process for child care – a people-oriented vocation, and accountancy – an abstract concepts-oriented vocation. The three examples used are chosen because they can be clearly situated as involving media of either 'materials', 'people', or 'abstract concepts'. As shown in Figure 4, many vocational courses involve much more of a mix of the three media.



Table 2: Desired outcomes mapped onto Child Care – a ‘people’ – focused vocation

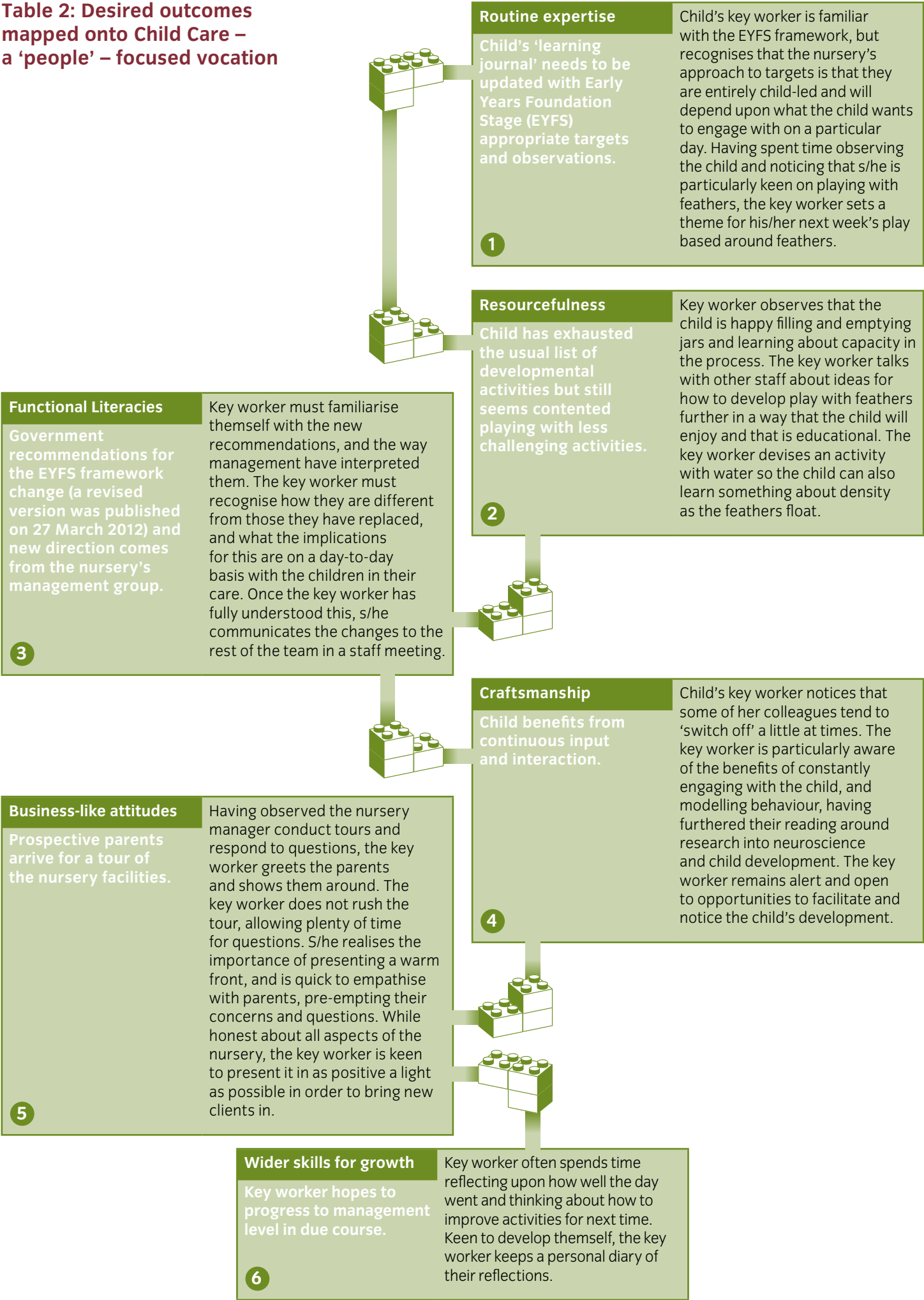
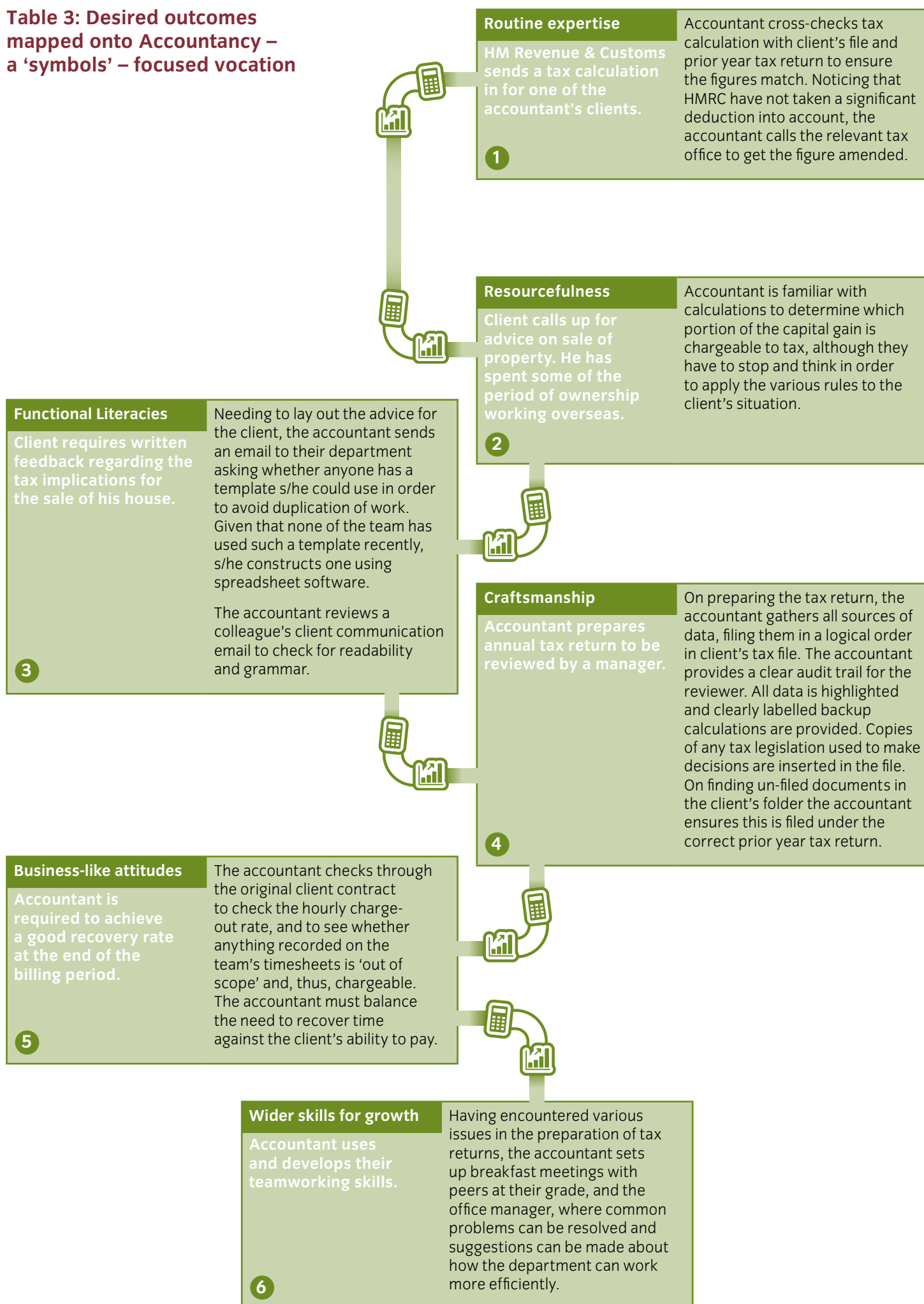


Table 3: Desired outcomes mapped onto Accountancy – a ‘symbols’ – focused vocation



5

Learning and teaching methods that work



5.1 Purpose of this chapter

In the previous chapter, we mapped the desired outcomes of vocational education onto our three categories of vocational education (physical materials, people and symbols).

In this chapter, we develop the argument that optimal vocational education requires a pedagogy that is mindful of the relationship between learning methods and desired outcomes. It must also be aware of the ways in which this relationship is altered by the nature of the specific learners in question, and the variety of settings in which learning is to take place. We aim to make some useful generalisations about learning and teaching methods which may have a place in vocational education. Then we move on to start to explore the ways in which certain kinds of learning and teaching

methods can best be deployed and integrated, according to their appropriateness to vocational subject and likelihood of producing the six outcomes we have suggested are part of vocational education.

Then, in the next chapter, we consider how context adds further complexity to pedagogic decisions in terms of the needs of learners, available teaching expertise, and physical settings.

Finally, in chapter 7, we explore some more fundamental questions of learning and teaching and their respective evidence bases, to offer a broader decision-making framework within which to place all that the report has been exploring up to that point.

Through exactly this kind of process we are beginning to develop a vocational pedagogy.

For me, the big driver in vocational education is that it involves real-time, real-world activities, with an opportunity to have a coach or guide available to review feedback, reflect with the person, or even to be that guiding hand through the process.

Andy Smyth

5.2 Effective learning and teaching methods in vocational education

There are many differing approaches to constructing learning in vocational education and here, rather than getting drawn into any of the debates around teaching and learning, we have chosen to highlight some methods which research suggests work well in a range of vocational contexts.

Each of our proposed six vocational education outcomes will be capable of being taught in different ways, but the specific categories of vocational education may lend themselves to being learned in specifically different ways. In 5.3 we start to map our three broad categories and six desired learning outcomes of vocational education against the specific learning methods we list in 5.2 and raise some of the issues which may be important to consider.

Some learning methods will suit certain learners just as some teaching methods will be preferred by some teachers and avoided by others. Contexts will influence choice too. What you can do in a studio or workshop may not be possible in a lecture theatre or on a production line, and these kinds of issues are explored in more depth in chapter 6.

Perhaps even more importantly than the choice of any specific method is the engagement of the learner in whatever is being learned. This depends fundamentally on the quality of human relationship established between teacher and taught. It requires understanding of the learner's needs (see 6.3). It requires the presence of teachers who model the kinds of behaviours required to produce our six desirable outcomes (4.2). And it requires high levels of trust and the creation of an environment in which mistakes and errors are expected and seen as a source of learning.

In our approach to vocational pedagogy we are seeking to create resilient and resourceful learners; learners able to face up to challenges, and able to think through the necessary steps to navigate through day-to-day difficulties. As John Hattie concluded:

It is what learners do that matters ... the aim is to make students active in the learning process ... until [they] reach the stage where they become their own teachers, ie they can seek out optimal ways to learn new material and ideas, they can seek resources to help them in this learning, and ... they can set appropriate and more challenging goals [for themselves].

(Hattie, 2009, p. 37)

Many teachers know and love their subject but are a little too reliant on how they were taught themselves. There does need to be much more of a depth of understanding about how people actually learn, and of what the journey of someone who is learning actually looks like.

Lorna Fitzjohn

In a study of learning in a vocational education and training programme for sales assistants, Vibe Aarkrog (2005, p. 137) demonstrated that both theoretical training through the vocational education and training school, and practical training in the workplace 'are necessary to develop competency'.

Similarly, in a paper presented at the British Educational Research Association Annual Conference (2001), Elise Alexander – exploring the training of nursery nurses through FE colleges – argued that good classroom learning is vital because:

without mastery of knowledge about work with children, students cannot think critically about the experiences they have in work placement and in college, and so cannot construct reliable knowledge upon which to base their judgements about children.

(Alexander, 2001)

As we develop our palette of different vocational teaching methods, we will try to make connection to all of the issues listed above, especially the way in which vocational pedagogy normally requires a subtle blend of theory and practice, action and reflection, solo and group, and learner-led and expert mediated.

Consistently good vocational education learning environments are full of opportunities for feedback, both from the 'teacher' and, increasingly, from the vocational learner as he or she becomes more and more self-aware and adept at noticing what is going on as he or she learns. See chapter 7 for a more detailed exploration of these issues.

In *Visible Learning*, John Hattie (2009) highlights four features of high quality practical learning:

- The learning arising from any learning experience is given explicit attention in the moment.
- Learners have specific, challenging, practical, goals in mind. Learning tasks are constructed with those goals in mind so that they are of benefit. We would add that these goals must be useful to enable learners to progress to higher levels of expertise in their chosen field.
- Feedback is clear and plentiful. Learners recognise the need to welcome and listen to feedback. We would add that feedback must be of sufficient quality and quantity that it is useful to learners.
- Teachers recognise learners' self-concepts and are fully able to coach them to develop improved learning dispositions and strategies.

While our focus is largely on formal teaching and learning, we recognise that a huge amount of the significant learning that takes place at work or through the workplace is non-formal (Eraut, 1999), as is the majority of human learning and vocational learning (Whittington and McLean, 2001, p. 158). It is not planned, but derived instead from experience of people and problems in the workplace or in life. Although it differs from formal learning as David Guile and Michael Young (1998) remind us, 'it is useful to assume that there are common processes underlying both learning in school and work-based learning (p. 178).

Of all the typologies we have encountered, the one created by David Perkins seems both thoroughly grounded in the literature and accessible (Perkins, 2009).

Here is an adapted version of his seven principles¹⁴ which seem well suited to both learners and teachers in the real world of vocational education:

- 1 Play the whole game – use extended projects and authentic contexts.
- 2 Make the game worth playing – work hard at engaging learners giving them choices wherever possible.
- 3 Work on the hard parts – discover the most effective ways of practising.
- 4 Play out of town – try things out in many different contexts.
- 5 Uncover the hidden game – make the processes of learning as visible as possible.
- 6 Learn from the team and the other teams – develop robust ways of working in groups and seek out relevant communities of practice.
- 7 Learn from the game of learning – be in the driving seat as a learner, developing your own tried and tested tactics and strategies.

The following list is indicative of methods which are relatively well-understood in some contexts. The majority are broadly ‘learning by doing’ or ‘experiential’, though many combine reflection, feedback and theory. For each one there is significant research to suggest that it might be effective in vocational education:

- Learning by watching
- Learning by imitating
- Learning by practising (‘trial and error’)
- Learning through feedback
- Learning through conversation
- Learning by teaching and helping
- Learning by real-world problem-solving
- Learning through enquiry
- Learning by thinking critically and producing knowledge
- Learning by listening, transcribing and remembering
- Learning by drafting and sketching
- Learning by reflecting
- Learning on the fly¹⁵
- Learning by being coached
- Learning by competing
- Learning through virtual environments
- Learning through simulation and role play
- Learning through games.

¹⁴ The first words of each of the seven are as written by Dave Perkins, the remainder are our interpretation.

¹⁵ A term to describe the opportunistic nature of VL whereby learners make requests for help from whoever is available to answer their questions.

You copy, you watch, you copy, and then the point comes where you are an expert. Then you don't understand why the novices are having such trouble, because 'it's obvious isn't it?'.
Alison Wolf

These methods are explored in the sections below.

5.2.1 Learning by watching

Learning how – or how not – to carry out an activity by watching others is a very common way of learning. Taking a cross-cultural perspective on human development, Barbara Rogoff (2007) argues that in cultures where home and work are not separated, children are able to learn life skills through direct observation and participation, what she calls 'pitching in'. Ethnographic studies have shown that by watching a range of 'mature' activities within the context of productivity for which the activity is being taught, children in indigenous communities of the Americas seem to show keener attention and collaboration than their middle-class Western counterparts (Rogoff, 2007).

The importance of watching others in order to learn is just as critical for expert teachers too. In an interview for the journal *Reflective Practice*, diving coach Andy Banks spoke of the benefits of seeing and watching what other coaches do, filming it, and bringing it home to discuss with other coaches (Dixon, Lee & Ghaye, 2012). Even as an expert, he recognised that the process enabled him to gather new perspectives on ways of doing things.

In vocational education, it will often be the case that a teacher will want to combine a short expert demonstration of a skill (which learners can seek to imitate – see also 5.2.2) with other more experiential methods which enable practice and trial and error (Hetland, Winner, Veenema, & Sheridan, 2007). Ultimately, a useful vocational pedagogy will provide pointers as to when and why such compilations of teaching and learning methods are best deployed.

5.5.2 Learning by imitating

According to the writings of Aristotle, imitation is the first way in which people learns. Today, although the science of imitation and the potential role of 'mirror neurons' is not fully understood, it is known that even this basic behaviour of imitation is itself learned (Jones, 2005). Imitation is seen in animals as well as in humans, with documented research highlighting 'the essential role that social learning and imitation play in propagating behaviour that allow animals to occupy an ecological niche which might otherwise be closed to them'. (Sanditov, 2006, p. 5).

Psychologist Albert Bandura was the first to propose a comprehensive theory of social learning in 1977 which went beyond the more commonplace theories of behavioural learning. While social learning theory recognises the importance of experience that leads to reinforcement, its key contribution is the idea that individuals learn through observing and then imitating others. A key point for vocational teaching is that a balance needs to be sought between allowing learning through experimentation and trial and error (with its resulting rewards – success, and punishments – failure), and allowing learning through imitation. As explained by Bandura (1976 cited in Sanditov, 2006):

Although behaviour can be shaped into new patterns to some extent by rewarding and punishing consequences, learning would be extremely laborious and hazardous if it proceeded solely on this basis ... it is difficult to imagine a socialization process in which ... vocational activities ... are taught to each new member by selective reinforcement of fortuitous behaviours, without benefit of models who exemplify the cultural patterns in their own behaviour... (Sanditov, 2006, p. 6)

Closely following the action of learning by watching, imitating then involves trying to implement what has been observed. While learning from an expert clearly has its benefits, the act of imitating another may often work best when the individual being copied is situated a little closer to the learner's own experience and can understand where the learners' difficulties are (Lave and Wenger, 1991). For this to work, imitating becomes entangled with explanation and instruction.

There are dangers inherent in imitation, however. In Alexander's rather damning critique of the learning taking place by nursery nurse trainees through college and through work placements, she found that students were far more concerned with 'fitting in' than with learning:

Instead of developing a coherent body of knowledge that enables them to work effectively with the children in their care, they are developing a set of performance skills that enables them to imitate what they see happening in the workplace.

(Alexander, 2001)

Of course, there is always the risk that inappropriate behaviours such as dangerous or limiting procedures could also be learnt from participating in the work environment (Billett, 2000) and vocational teachers – both in and out of the workplace – need to be vigilant for evidence of this in order to correct it.

Both watching (5.2.1) and imitating combined with being coached (5.2.14) and practising (5.2.3) are central to apprenticeship.

5.2.3 Learning by practising

In our exploration of vocational learning from the perspective of the 'learning sciences' we proposed that there are five different kinds of practice, Claxton *et al* (2010):

- 1 'Getting the feel': on first trying something new, the body has no recollection of how an action should 'feel'; no 'muscle memory'. Over time, the body establishes a template of how it 'feels' when the action seems to be going well.
- 2 'Automating': until 'muscle memory' has been established, the golfer makes unreliable shots. The learner is able to automate the skills to the point when conscious thought is no longer required for each element of the action. Although the golfer may still need to process distance and wind speed, he does not need to consider his swing. Time, determination, and attention are required at this stage of practice (Ericsson, 2002).
- 3 'Picking out the hard parts': when an action does not lead to the desired outcome, the learner deconstructs that action to consider at which part the process erred (Perkins, 2009).
- 4 'Improvising': automated practice can become staid and lacking in creativity. Effective practice can involve a level of playfulness in trying new ways of working.
- 5 'Doing it for real': skills become refined when they are tested in real-life situations which may be competitive, stressful, or pressured in some way.

We concluded this proposition with the recommendation that good teaching will interweave these five kinds of practice, explaining the purpose for each to learners.

More than length of experience, reputation, and perceived mastery of knowledge and skill, 'deliberate practice' is key to successful mastery of activities and actual, observed performance (Ericsson, 2008) and may also be critical to the maintenance of expert levels of performance (Lie, 2011). Deliberate practice involves a focus on improving particular tasks. Anders Ericsson proposes that it also involves provision of immediate feedback, time for problem-solving and evaluation, and opportunities for repeated performance to refine behaviour.

Studies of deliberate practice have spanned competitive sports, including: darts, chess, and football; typing and decision making; and professional domains including teaching, insurance sales, and strategic and organisational consulting (Lie, 2011, p. 108). Helen Lie's review of the literature on deliberate practice found that what constitutes deliberate practice varies from one domain to another. In a range of studies it has been reported as: owning books, taking a class, practising alone, practising with a group, seeking a quiet study environment, being mindful when performing regular job duties, and reading scientific literature. Other practices include practising the hard bits, speeding things up, slowing them down, chunking it up, and so forth.

While confirming support for the importance of deliberate practice, other studies found that it may not be sufficient on its own to explain expertise (Campitelli and Gobet, 2011, Mainz and Hambrick, 2010) and that other factors came into play such as working memory capacity. Nevertheless, the significance of deliberate practice makes it imperative that practice should be a focus of teaching and learning activities.

Michael Eraut introduced another element to practising with his idea of 'time available' and the 'crowdedness of the situation' (Eraut, 2000) to explain how the effect of time affects the way we think when learning:

Shortage of time forces people to adopt a more intuitive approach, while the intuitive routines developed by experience enable people to do things more quickly. Crowded contexts also force people to be more selective with their attention and to process their incoming information more rapidly. Under conditions of rapid interpretation and decision-making, meta-processes are limited to implicit monitoring and short reactive reflections. However, as more time becomes available, the role of meta-processes becomes more complex, expanding beyond self-awareness and monitoring to include the framing of problems, thinking about the deliberative process itself and how it is being handled, searching for relevant knowledge, introducing value considerations and so on.

(Eraut, 2000, p. 24)

Effective practising can be brutal; not literally brutal but you break it up; you focus on each little bit. For example, you don't learn to be a footballer by just going out and constantly playing games.

Alison Wolf

A specific and important kind of practising is mental rehearsal. Sports psychology has generated a good deal of useful practical knowledge about how to use imagination and undertake high quality. This knowledge is useful to apprentices and vocational learners, just as it is to athletes. Indeed, this knowledge has begun to be applied in a range of fields. Here, for instance, is a surgeon talking about the way he prepares for an operation:

A lot of times ... I will look at the angiogram – the dye study that shows the aneurysm and the anatomy around it. And typically what we will do is position the patient, prep the wound, look at the angiogram films and kind of imprint them in your mind. And then just go out into the scrub sink where you are by yourself. You've got five minutes there. And all you're doing is just scrubbing your hands and it's just a time of rote activity ... and that's the time I'll try to piece together the anatomy with what I am about to do ... I try to picture what I am going to see when I get there, because the x-rays are taken at a couple of fixed angles straight on or from the side, and we are coming in at a 20 degree angle to that.

(cited in Brown, 2001)

Students do better in exams if they have rehearsed in imagination (Taylor, 1991). Principals do better in a tricky meeting if they have imaginatively rehearsed it beforehand. Musicians learn faster if they supplement their hours of practice with mental rehearsal (Markman, Klein & Suhr, 2009). Though we know of no direct research, there must be a strong presumption that apprentice welders and student nursery nurses would also benefit from such practical knowledge about how to maximise the efficiency and reliability of their own learning.

Vocational teachers need to be able to give clear guidance as to how practise can be most effective, whether for example, an activity needs to be broken down into its component parts, done against the clock, deliberately slowed down, done without being able to see, and so on.



If you can't have 1:1 learning (which in a mass education system, you can't) research tells us that the next best thing is how you give feedback; how you sit down and work through with students how they are doing.

Sally Dicketts

5.2.4 Learning through feedback

Feedback is a learner's primary mechanism for charting progress. Feedback is also a central element of formative assessment (Wilson, 2012). Feedback in education involves four elements:

- 1 Data on the actual level of a measurable attribute.
- 2 Data on the reference level of that attribute.
- 3 A mechanism for comparing the two levels, and generating information about the gap between the two levels.
- 4 A mechanism by which the information can be used to alter the gap. (Black and Wiliam, 1998, p. 48).

Of course, feedback must be given carefully if an individual is to improve their performance as a result. Black and Wiliam (1998) cite research that suggests there are four broad responses to feedback:

- 1 A committed individual can attempt to change his behaviour to reach an explicit, clear standard that they believe is obtainable;
- 2 An individual can abandon the standard, particularly when belief in its being obtained is low (Black and Wiliam cite Carol Dweck's notion of 'learned helplessness');
- 3 An individual may lower (or raise) the standard, particularly if he is supportive of it; or
- 4 He may choose to deny existence of the standard. (*ibid.*, p. 49)

The job of the teacher is, therefore, to craft useful feedback to help ensure learners adapt their behaviour to improve performance outcomes. In this well-researched area, we know much about the resources available to teachers in making assessment judgments; what it means to give quality feedback; how quality feedback can be delivered; how learners can make sense of feedback; the conditions in which feedback can support learning; and the role of the learner in engaging with teacher-student or peer-to-peer dialogue (Wilson, 2012). Integrating feedback with all of the methods listed in 5.2 is important. A goal of all teaching is to create learners who can give themselves feedback as they learn without others supporting them.



5.2.5 Learning through conversation

Conversation in the workplace, sometimes referred to as ‘watercooler talk’, is an essential aspect of learning (Baker, Jensen & Kolb, 2005). Ann Baker and colleagues have shown precisely how an executive team goes about making sense of the various things it is experiencing and learning, using different kinds of conversation. For conversations to occur, it helps to create spaces for them:

Making space for conversation can take many forms – making physical space, such as when a manager moves from behind his or her desk to join colleagues around a table; making temporal space, such as when a family sets aside weekly time for family conversation; or making emotional space through receptive listening.

(Baker et al., 2005, p. 424)

Good vocational teachers deliberately seek to engineer rich conversations between learners at different stages, ideally putting apprentices and those studying for qualifications at higher levels in the same workshop space so that young and old, novice and expert can talk to each other¹⁶.

Informal workplace conversations can help prepare novices for scenarios they may face in future jobs. Orr (1987, cited in Billett, 2000), reported how photocopy repair technicians would share ‘war stories’ with one another, which built up the community’s knowledge of how faults were identified, diagnosed and repaired. Similarly, in an empirical exploration of the learning dispositions developed by plumbers the authors found:

Conversations in the Merchants about a rare job that one person had come across would be ‘how that [other] person learns ... because it’s so rare that you might not come across it [otherwise]’. The response from others was to listen and learn, which ‘saves you finding your own solution to it’ (Spencer, Lucas & Claxton, 2010, p. vii)

In their ethnographic study of apprenticeship learning by Yucatec midwives, Jean Lave and Etienne Wenger (1991) emphasised the role of conversations about problematic cases. As stories were told by attendees at a birth, other attendees offered similar stories. Together, the stories were packaged as ‘situated knowledge’. Becoming a midwife thus includes the possession of a store of appropriate narratives, and the discernment to know when to share them.

To encourage development of reflection, it’s very much about challenging learners in a non-challenging way, which is a bit of a contradiction. We have 1:1 conversations with them; we have debriefs on activities; and in our normal performance process as the employer we would always challenge them: ‘how do you think that went?’, ‘do you think there was anything you would like to do differently?’, ‘what do you think next time you would do, should the same thing happen?’. It is about open questioning, and really trying to help people to explore their own experiences and to provide their own answers in this respect.

Andy Smyth

¹⁶ This is the approach, for example, at The National School for Furniture at Oxford and Cherwell Valley College in Oxford.

At one particular centre of excellence for engineering you will see learners working with highly experienced craftsmen and technicians, gradually acquiring their skills. They interact conversationally with these people; they interact with one another; they will talk about their problems. No doubt back at college they will acquire a deeper understanding of the actual principles that underpin the practice, but that theoretical knowledge would be absolutely vacuous and empty were it not seen within the context of what they are doing.

Richard Pring

Of primary importance in terms of conversation is the role of questioning. In educational settings, the teacher asks questions in order to ascertain the degree to which learners are familiar with new learning content, as well as the extent to which they have grasped it (Mäkitalo, 2005). Questioning also plays a part in the effective learner's repertoire of behaviour. The process of questioning facilitates reflective thinking by prompting meaningful discussion. And yet, the construction of intelligent questions requires a certain threshold level of domain knowledge and metacognitive skills (Choi, Land & Turgeon, 2005). Ikseon Choi *et al.*'s study demonstrated that learners can be taught to 'scaffold' one another's questioning through the use of further prompting or probing questions. Teachers can scaffold learners in the same way, by asking three types of question:



1 Clarification or elaboration

questions – it may be apparent that a learner has not thought through the full implications of an idea. Their explanation may be unclear, incomplete, or incorrect. For example, a hairdressing teacher might ask the learner how a client's prior history of colouring treatment affects the way the learner intends to apply dye this time.

2 Counter-argument

– when the learner and teacher have very different understandings, this type of questioning brings about 'cognitive conflict' in the learner, who either strengthens their position, or re-evaluates their ideas. The teacher might ask a clarifying question regarding the learner's reasoning for selecting a lighter tone over lowlights, and then ask, given what the learner knows about the chemical properties of the two types of colour, which might give the most natural look.

3 Context- or perspective-oriented questions

– when there is nothing inherently wrong in the learner's idea, this type of questioning stimulates the learner to consider multiple perspectives on the problem. The teacher might ask the learner how he might change his plan if the client had had no prior colour treatment.

Diving coach Andy Banks refers to 'head sitting', his method of questioning others, as a means of developing expertise:

I'm a big believer in if you want to become good at something you find someone that's better than you and sit on their head, and hopefully not be too much of a pain in the neck but ask 'why did you do that?' 'what did you do that for?' 'how do you do this?' 'how do you do that?' until they swear at you and say 'go away'.

(Dixon et al., 2012, p. 350)

This year we're looking at second year students working with first year students to help them grasp what's going on. Students are enabling other students to learn. Our level 3 catering students are working as managers and doing some teaching and development of the students. This means they become better at understanding their work, because the best way to learn theory is to teach it to somebody else.

Sally Dicketts

5.2.6 Learning by teaching and helping

Learners themselves can learn by teaching and helping one another. Jean Lave and Etienne Wenger (1991) developed the concept of 'communities of practice', which refers to groups of people undertaking a common or related activity. Seen through this lens, learning itself is a process of 'becoming'; of constructing an identity through participation in a community of practice.

The focus on learning as 'participation' in a community sees learning as an 'evolving, continuously renewed set of relations' (*ibid.*, p. 50). Newcomers to any community eventually become 'old timers' (*ibid.*, p. 56) and they get there through a continued process of renegotiation (*ibid.*, p. 51) of meaning. Taking a de-centred view of the master-apprentice relationship, Lave and Wenger suggest that mastery resides in the organisation of the community of practice rather than in the master. This is to say that apprentices learn mostly through relationships with other apprentices: 'there is anecdotal evidence ... that where the circulation of knowledge among peers and near-peers is possible, it spreads exceedingly rapidly and effectively' (*ibid.*, p. 93).

'Peer learning' refers to the use of teaching and learning strategies whereby learners learn from one another without immediate intervention from a teacher. Peer learning (and other collective forms of learning) are argued to better suit some learners, although there are pedagogical challenges to its formal implementation (Boud, Cohen & Sampson, 1999). There are, additionally, benefits associated with implementing peer learning, including:

- Development of learning outcomes related to collaboration, teamwork, and becoming a member of a learning community;
- Enhanced opportunities for learners to engage in enquiry and reflection, given the absence of a teacher to answer questions directly;
- More practice in communicating subject matter to others, and more experience of having it critiqued by peers on the same learning journey; and
- Better identification by individuals of their own learning needs, and development of the ability to plan how these might best be addressed.

If you think back to the medieval guilds, where people were inducted not just into a set of skills but a set of values; where excellence really mattered, you wouldn't get your apprenticeship or be made a journeyman or a master craftsman, until you could demonstrate that you were capable of high standards. Until you could go out and teach other people and initiate them into this skilled work, but also into the values which related to it, which were concerned with high standards of perfection of work.

Richard Pring

5.2.7 Learning by real-world problem-solving

Learning by attempting to solve real-world problems can be a highly effective means of developing expertise. ‘Problem-based learning’ is an enquiry-based approach to problem solving that grew out of medical education. It is intuitively appealing as a way of developing knowledge in the context of vocational education. (Savery and Duffy, 1995). A meta-analysis of the effectiveness of PBL (Albanese and Mitchell, 1993) showed that although PBL students out-scored their peers in clinical performance, this was at the cost of lower basic science exam scores, and more study hours per day. More evidence of the effectiveness of PBL is needed, however (Allen, Donham & Bernhardt, 2011, Jerzembek and Murphy, 2012), not least because minimal research has been conducted outside the areas of medical and gifted education (Hmelo-Silver, 2004).

There have been attempts to develop pedagogy that tries to reconcile the tensions between teaching through expert demonstration and transmission, and between learning through more constructivist approaches that allow the learner to experience learning through the sorts of method we have covered in this section. An example is Nicholas Farrar and Gill Trorey’s (2008) attempt to understand dry stone walling.

In the dry stone walling example, learners must learn to solve numerous problems with each stone laid. Farrar and Trorey’s exploration of the process of becoming a dry stone walling ‘expert’ reveals how real-world problem-solving develops the learner in this context.

First, putting rules into practice by applying them in real-life scenarios allows the learner to gain valuable experience to the point where, over time, he is able to treat rules as ‘guidelines’, working around them if a ‘better’ result will ensure from an alternative action. In the case of the dry stone wallers, the ‘rule’ was that walls had to be built to a straight string line. The ‘better’ result was greater speed (faster walling) and efficiency (less wastage of flat stones) brought about by knowing when to ignore the rule.

Second, dry stone wallers followed certain ‘maxims’. These weren’t rules, but summarised a great many aspects about walling, and were often hard to grasp in practice. For example, they all knew that picking up ‘the right stone’ was key to successful walling. And yet it was only through the experience brought about by real-life problem-solving that the instinctive selection of the right stone developed.

Third, practical problem-solving gave wallers the opportunity to stand back – literally – and reflect on their progress.

Fourth, real-world problem-solving gave wallers the opportunity to experience a state of ‘flow’, the state of being totally engaged in an activity, and within a deeper application of thought.

Fifth, real-world practical experience gives learners the opportunity for emotional involvement. Farrar and Trorey found that wallers linked emotion with the learning of their craft. A better appreciation of the beauty of the product, or the ingenuity that went into creating it, for example, gives the learner a desire to do the job well.

In their thinking about workplace learning, Lorna Unwin and Alison Fuller have helpfully introduced the notion of the ‘expansive apprenticeship’. This idea is a development of Yrgö Engeström’s ideas regarding the tension between expansive (pro-learning) and restrictive learning environments. A restrictive apprenticeship is found where organisations want to produce profitable workers as quickly and cheaply as possible. Naturally, this does not facilitate the learner to enquire and reflect. To develop real-world problem-solving abilities in learners, they need to be given more ‘expansive’ experiences in order to be able to contribute to business success and to develop worthwhile careers. Fuller and Unwin propose that education providers (and, accordingly, this must be considered when developing vocational pedagogy) take into account the ‘dual identity of worker and learner, and commit themselves to a model of apprenticeship that has pedagogic, social and economic value’ (2008, p. 21).

Real-world problem-solving is at the heart of what is referred to as constructivist approaches to learning. John Savery and Thomas Duffy (1996) usefully summarise these to include the creation of authentic tasks which are anchored to the real world, high levels of ownership by learners of the tasks they undertake, learning environments which support and challenge learners’ thinking, and opportunities for learners to take responsibility as they develop alternative ideas and strategies.

Real-world problem-solving is core to any vocational pedagogy. But, depending on the nature of the vocational education and on the contexts in which it takes place (see section 6), it may take many forms. It also requires structured processes for expert feedback and learner reflection.

5.2.8 Learning through enquiry

Learning through enquiry may well have been part of what we have just been describing in 5.2.7. But it also has a number of other meanings. For example, the ‘enquiry’ approach is often used to describe a philosophical approach to developing learners’ thinking, for example in schools where it is known as Philosophy for Children (Haynes, 2008).

The enquiry approach is mostly typically advocated in science education as a way of enabling students to learn science concepts more deeply. In particular, it enables them to be able to filter their understandings through the lens of epistemology (or ‘nature of science’), which asks ‘how do we know what we know?’ and ‘why do we believe it?’ and ‘what exactly do we know?’ – essentially, questions about the relationship between theory and knowledge (Sandoval, 2005). Sandoval suggests that enquiry and epistemology are frequently decoupled and, hence, there is little proof that enquiry-based instruction leads to students leaving school with a robust understanding of the nature of science.

Enquiry-based learning includes activities, in which students, individually or in groups, become involved in a process of inquiry and knowledge production relating to a specific problem and learn through inquiry rather than through simple transmission of knowledge from the teacher.

(Gilardi and Lozza, 2009)

This may mean taking part in teachers' research projects, or carrying out authentic research in the classroom (or perhaps workplace). Although written with an interest in undergraduate professional development, Silvia Gilardi and Edoardo Lozza's research explores the possibility that enquiry-based approaches may promote a professional attitude to work. They suggest that an enquiry approach that develops reflective and research skills could be 'indispensable for becoming an effective professional able to build situated knowledge collaboratively and rigorously' (Gilardi and Lozza, 2009, p. 225). Such a learning outcome is surely of particular interest to vocational educators.

Indeed, in a comparison of enquiry based learning and problem based learning, Graeme Feletti (1993) suggests that enquiry-based learning 'may be more attractive to a wider range of vocational training and professions education programmes because of its flexibility in choice of methods, less emphasis on teaching specific problem-solving paradigms, and less reliance on resource-intensive learning experiences' (*ibid.*, p. 143).

Whether teachers choose to use enquiry-based methods is more than just a simple methodological choice. For adopting such approaches brings with it an attitude to knowledge that assumes that vocational learners are capable of undertaking enquiry, that such enquiries are worthwhile and that students may know or discover things not necessarily known by the teacher. It assumes that learners are worthy co-creators of understanding. Some teachers have concerns about enquiry preceding transmission or expert demonstration ('learners may pick up bad habits'). While some of these concerns may well be justified, they do not preclude intelligent combination of methods – problem-solving preceded by expert demonstration or accompanied by real-time feedback from a coach or followed by structured reflection.



5.2.9 Learning by critical thinking

Critical thinking is the application of appropriate skills and strategies in order to obtain a desired outcome. It involves monitoring thinking processes, checking whether progress is being made towards the desired goal, and ensuring accuracy. In order to learn critical thinking, learners can be taught metacognitive strategies that help them to control their thinking processes (Ku and Ho, 2010).

Unsurprisingly, most employers want their employees to be able to think critically for themselves, and this is recognised at a country level in vocational frameworks across the world, which often call for the skills of critical thinking.

But the pedagogy for cultivating such skills is all too often underdeveloped (Pithers and Soden, 2000). Ellen Langer has shown how teaching content 'mindfully', consciously teaching from multiple perspectives, and inviting an open-endedness to complex problems and an awareness of the importance of context is important (Langer, 1997).

Critical thinking would seem to be a complex and under-explored area of vocational pedagogy. Yet, most writers in the field seem to be agreed on the point that to promote critical thinking the students must learn to teach themselves to reflect and refine the strategies, to develop their metacognitive knowledge and skills (eg weigh evidence, look for interrelatedness or interrelationships, develop stable hypotheses).

(Pithers and Soden, 2000, p. 243)

Turning to a specific example linking the pedagogy of sewing to that of learning to write, Liz Rohan (Rohan, 2006) demonstrates how early domestic arts (sewing) educators 'emphasised what are now lauded as contemporary pedagogical initiatives such as an emphasis on visual literacy, the production of multimodal texts, critical thinking, discussion, and sequenced courses focused on the production as well as the consumption of knowledge' (*ibid.*, p. 98). Before the 'ready-made' clothing industry took over, early domestic arts educators:

- Believed in curricula that emphasised creativity over mere demonstration of skill.
- Focused on learning through sequenced activities and assignments that promoted the production of knowledge rather than its passive absorption. (*ibid.*, p. 80)

In today's economic context where creativity is paramount (Spencer, Lucas & Claxton, 2012), a vocational pedagogy that promotes deeper levels of thoughtfulness and inventiveness is to be desired.

5.2.10 Learning by listening, transcribing and remembering

The idea that learners can learn by listening, transcribing, and remembering, is more akin to the traditional model of teaching – as it is commonly perceived – where the teacher transmits knowledge, and the learner's job is to note-take and repeat back to what he has learned. Although more 'facilitative' teaching styles and more 'experiential' learning are popular, there is certainly a place for listening. Kirschner, Sweller & Clark, (2006) argue that the human mind, particularly its memory function, requires clear instruction and not continual problem-solving approaches. Expert problem-solvers require a bank of stored experience that is accessible. They argue that during enquiry or problem-based learning activities, these banks of memory (where they exist) are less easy to access.

Citing case study research, they report that learning goals were achieved by students when teachers spent 'a great deal of time in instructional interactions' (*ibid.*, p. 79). Further, they argue for the effectiveness of worked examples over problem-solving approaches in certain situations – namely: 'for novices, studying worked examples seems invariably superior to discovering or constructing a solution to a problem' (*ibid.*, p. 80). They explain this difference using 'cognitive load theory'. Use of a worked example reduces working memory load to allow the learner to discover the essential relationships between different alternatives. Learners thus develop their own problem-solving schemas and, thus, have a memory bank from which to access solutions later on.

In the same way that Duckett and Tatarkowski (2005) lay out a number of methods for teaching those whose preferred 'learning style' was visual, they similarly lay out methods for teaching those whose preferred style is auditory. We would suggest, again, that rather than tweaking the method for the learner, teachers might like to use these methods of delivery where the learning content is best taught in an auditory mode of delivery:

- Using verbal instructions and explanations.
- Using appropriate music to complement learning.
- Encouraging debate, discussion, and analysis.
- Talking in a positive way.
- Using word patterns such as rhyme, rhythm, or mnemonics to learn information.
- Reading out loud.
- Encouraging learners to question one another.
- Using audio recordings of relevant material. (*ibid.*, p. 28).

Some vocational teachers undoubtedly deliver content by talking more than is necessary when, perhaps other means of facilitating learning would be more appropriate. Although talk is not a bad idea per se, it is important that teachers understand the contexts in which talk is most, and least, beneficial for learning.

5.2.11 Learning by drafting and sketching

Within the context of drawing being relatively under-theorised as a discipline, Richard Hare (2004) explores the pedagogy of sketching as a means for (landscape architecture) students to engage with the complexities around them. Although his students are first-degree-level learners, it is not unreasonable to suggest that his argument – that when the learner uses the process of sketching, he consequently thinks and acts differently from those who do not engage in sketching – could be equally applied to the vocational learner.

Hare includes ‘observational drawing, idea generation, diagramming, design working drawing and doodling’ in his analysis, recognising that a sketch is not necessarily something that is ‘incomplete or ill formed, though it may be both’ (*ibid.*, p. 234).

The process of sketching has different functions to the learner. For example, to a landscape architect (*ibid.*, p. 242) sketching:

- › Allows the collection of sensory impressions.
- › Makes possible the creation of a whole.
- › Facilitates discovery and formation of problems.
- › Enables the learner to try and organise or solve problems.
- › Assists the learner in communicating his learning to others. We could propose that it also provides opportunity for the learner to receive feedback from relevant others.

In an interesting example of Hare’s ‘music module’, he describes how students are required to create a sensory space in response to a piece of music. The piece of work they produce is evolutionary; beginning with abstract sketching, and moving to sketch modelling, when student’s responses and tutor’s feedback (and potentially the sketches of other students) become interspersed on the drawing board. The final stage is the use of photo editing software that allows further manipulation of the student’s response to the music.

Sketching as the development of diagrammatic representations is not just a tool that serves the academic aims of the curricula. It is not just a ‘skill’ to be applied to other activities – though tends to be regarded as such. Instead, it offers working, teaching, learning and reflecting methods. Most importantly from a pedagogic perspective, it is an essential element of the learning process as learners consider design problems and develop design solutions (*ibid.*, p. 234).

Drawing has also been the traditional approach to improving spatial visualisation abilities in engineering design. Despite the use of computer-aided design software, it is still considered that the most effective way for an individual to learn how to read drawings is to learn how to make them (Contero, Company, Saorin & Naya, 2007, p. 4). By learning to draw, the individual is able to picture three-dimensional shapes in their mind. Manuel Contero *et al.*, cite two studies, including a longitudinal study by Potter and Van der Merwe, demonstrating that spatial ability influences performance in engineering, and that it can be increased by teaching that focuses on training ‘perception and mental imagery in three-dimensional representation’.

While the examples above draw on occupational sectors with an obvious design content, it may be that sketching might help in other contexts.

5.2.12 Learning by reflecting

Reflection is an integral part of learning. But, as we recognised earlier, reflection alone is insufficient to develop better practice. David Perkins (2010) suggests that practice alone is not enough because ‘mere practice can lead youngsters to entrench their old patterns of thinking rather than repatterning and depatterning to develop more effective thinking’. It is for this purpose that reflective intelligence is necessary. Learning becomes effective as individuals consider, and re-think, their existing thought and behaviour patterns.

There is a body of knowledge relating to ‘experiential learning’. Often cited with regard to both general and vocational education, David Kolb’s (1984) notion of an experiential learning cycle encompassing experience, theory-generation, reflection and more experience is intuitively sound. Kolb’s learning cycle is widely used as an example of pedagogy in action. It helpfully connects theory to practice and reflection to action.

But as a pedagogical theory, Kolb’s cyclical approach to experience can appear to be too neat with regard to how we learn. For example, sometimes we learn more effectively when we develop a theoretical understanding first and then test it out later in practice; whilst at other times, such a conceptual orientation actually disrupts or retards experiential learning.

It is no longer (if it ever was) sufficient to teach with the aim of imparting ‘knowledge’ or ‘skills’. Instead, teaching must enable learning (Tsang, 2011, p. 2), and teaching for reflection is a way of achieving this. Reflection is fundamental to learning, and provides a basis for future action (Ayas and Zeniuk, 2001). Effective learning through work happens as individuals reflect on events at work – including errors (Hetzner, Gartmeier, Heid & Gruber, 2011). Tsang suggests the ability to reflect is a highly desirable attribute to cultivate in ‘professionals’ – and we would include all forms of practitioner – because of the way ‘it signifies quality assurance through a sustained cyclical process of self-examination, self-evaluation, self-directed learning, enlightenment, self-optimization and transformation’.

I think the process of reflection in learning is something that we absolutely need to focus on, because very few people are capable of doing reflective development all on their own. They need input; they need feedback, in order to complete that reflective process.

Andy Smyth

The idea of ‘mindfulness’ is really powerful. Most students have so many things going on in their brains other than learning. Mindfulness is a way that you begin to get them to hold their brain still so that they can begin to concentrate. I think we underestimate the importance of some of the techniques that we actually need to teach students in order to get their brains working.

Sally Dicketts

Reflectiveness is about being ready, willing, and able to become more strategic about learning (Claxton, 2007, p. 30). It relates to self-knowledge and self-awareness. The reflective learner:

- Plans: taking responsibility for organising his learning.
- Revises: changing plans to cope with the unexpected.
- Distils: drawing out useful lessons for practice from experience.
- Engages in meta-learning: drawing out useful lessons for learning from experience.

Reflection is often interpreted as reflective writing or reflective journaling, in practice. Yet evidence for the efficacy of either is inadequate and controversial (Tsang, 2011, p. 2) and there are pedagogic difficulties in using learning journals to enhance learning, although they can be useful given correct guidance (Barnard, 2011).

Finding ways of integrating reflective practices into students' learning in vocational education is a central challenge to the construction of a vocational pedagogy.

5.2.13 Learning on the fly

Much of workplace learning is informal, arising out of the day-to-day demands and challenges of the job, including remedying problems, taking steps to boost quality or productivity, and managing change; or out of the daily social interactions with colleagues and customers or clients. The ways people work in practice often differ fundamentally from the way such work may be described in training programmes (Brown and Duguid, 1991). When working on the fly, working and learning cannot

be separated out, and workplace learning involves a combination of self-directed learning, and taking advantage of spontaneous opportunities to learn, as and when they arise (Eraut, 1999).

Research has identified a number of factors that facilitate informal learning. These include:

- Sufficient task variation.
- Participation in temporary groups.
- Opportunities to consult experts inside and outside the workplace.
- Changes in duties and work roles that stimulate learning.
- Work roles that allow for peripheral participation in communities of practice.
- Work roles that allow for facilitation of informal communication, problem solving, and innovation within communities of practice.
- Structures and incentives for knowledge sharing.
- Job mobility.
- Autonomous jobs (Skule, 2004).

Learning 'on the fly' is not a specific approach or method, but a combination of appropriate approaches that cannot, by nature, be scheduled. While formal learning schemes may involve mentoring, shadowing or coaching, more informal learning involves consultation and collaboration within the sphere from which a learner finds himself influenced, which is often 'more transient than implied by the euphemistic metaphor of a 'community of practice'' (Eraut, 1999, p. 2). It often involves observation and imitation. It infrequently involves use of written materials such as manuals (Eraut, 1999).

5.2.14 Learning by being coached

Coaching is a core element of executive training these days, and has a distinguished history in sports. It has a role to play in promoting excellent performance in the workplace, through its usefulness in a variety of vocational learning situations (Collett, 2012). There is a body of coaching knowledge that relates from 'sports psychology' which is of potential interest in the creation of a vocational pedagogy. Given that much vocational education depends on the quality of coaching relationships, literatures about disciplines such as sports science have much to offer. Aidan Moran's (2003) work on the psychology of sport is one example of, for example, goal-setting, and the relationship with states of mind and the use of mental imagery.

The apprenticeship is perhaps the ultimate model of coaching in action. Within the construction workforce, its ageing profile (Abdel-Wahab, 2012, p. 151) lends an urgency to the incentivisation of mature, experienced, workers to participate in the coaching and mentoring of a younger workforce.

Within the body of knowledge on sports coaching, the practice of coaching is recognised as being a complex activity, because of the interaction between people and their dynamic environment (Dixon *et al.*, 2012).

A very real problem with vocational education is that the significance of practical learning, learning by doing, is not recognised. Learning by doing is different from doing theory and then applying it. To learn to do you need someone looking over your shoulder saying 'no, it's not quite like that, it's like this'. That's how a carpenter or bricklayer acquires a practical grasp of the standards expected. It's not by learning it in theory, but because those standards are acquired implicitly through correction by people who show what the standards are, and correct you where you do not meet those standards, and where they repeat it until you have internalised those standards.

Richard Pring

Based on Dixon *et al.*, (2012), the following points relate to the functions fulfilled by a coach that help the learner to learn:

- **Planning:** in coaching World Champion, and 2012 Olympic diving hopeful for the British team, Tom Daley, coach Andy Banks helped his protégé plan backwards, thinking through ‘this is where he needs to be, this is where we are now, so what are we going to do now to achieve that...’ (*ibid.*, p. 343).
- **Dictating or facilitating:** Banks also describes his role through the life of a young athlete, beginning as a ‘dictator ... because they haven’t got a clue about anything’ and ultimately becoming the ‘advisor’ and ‘facilitator’ (*ibid.*). Even within this progression, however, there must be scope for flexibility, with the coach switching between the role of dictator and facilitator as necessary, to get the best out of the learner.
- **Supporting emotionally:** the ability to control emotions comes with maturity. Young people in particular may need help on an emotional learning journey, especially where the journey is high-stakes and they are investing their all into developing their skills for this one vocational area. Banks described the importance of realising a downward spiral, and the use of ‘happy thoughts’ and breaks in coaching Daley.
- **Talking through failures:** Banks describes the way he helped Daley understand why and where he had gone wrong, and the importance – from a psychological point of view – of ‘focusing on process and totally ignoring everything else that’s going on’ (*ibid.*, p. 345).
- **Focusing on performance:** performance can be controlled; outcome cannot.
- **Being trustworthy:** maintaining mutual trust and respect.
- **Keeping it ‘fun’:** ensuring that learners want to be there.
- **Encouraging competition:** facilitating competitions and fostering the competitive spirit in order that learners might challenge one another and their skills might be refined in a scenario of ‘doing it for real’ (see our section on learning by practising).
- **Encouraging reflection:** Banks suggests that others wanting to follow in his coaching footsteps should learn to coach by gleaning ideas about how to coach from as many sources as possible, believing that all information ‘is worth assimilating’ (*ibid.*, p. 351) whether or not it ends up being disregarded. He suggests this knowledge should be taken from a broad pool of experts, beyond the immediate field.

Coaching is a critically important part of vocational education and just how it can be combined with other methods is an important question in the creation of a vocational pedagogy.

5.2.15 Learning by competing

Constructive competition can be defined as a social and cultural phenomenon that can enhance learner's abilities, develops their ambitions and encourages their learning. It can motivate individuals to stretch beyond their own expected abilities (Williams and Sheridan, 2010). By the same token it can frustrate and demotivate some. But as all work is, in a sense competitive – businesses even talk of their competitors – it would seem sensible to assume that competitive approaches should form part of any blend of vocational teaching methods.

The heat of competition can help refine learners' developing skills. In *Skills for Sustainable Growth* the Department for Business Innovation & Skills (BIS, 2010, p. 22, s. 26) suggested that 'skills competitions and awards can provide an excellent opportunity to raise the profile of the vocational skills across the UK and inspire young people to develop their skills'. The UK hosted the WorldSkills International competition in London in 2011, where young people from 51 countries competed in skills areas from aircraft engineering to floristry. BIS hoped that this would encourage young people to consider gaining vocational skills as a route to a worthwhile career.

Competition can either be constructive, or destructive, however, and the manner in which competition occurs impacts upon its usefulness to the learning process. In an empirical study, Pia Williams and Sonja Sheridan (2010) found that the ways in which competition develops in school contexts tends to be a question of chance rather than being the result of conscious choice on the part of the teacher or learners. Although it has been remarkably difficult in the world of research to pin down the conditions for constructive competition, Williams and Sheridan's study highlights the importance of learners and teachers who are involved in competitions:

- Understanding their own competences.
- Being able to share their knowledge.
- Understanding the meaning of learning.
- Developing an attitude that holds collaboration and competition as tools for learning in the long term, rather than focusing on the short term 'win' only.
- Having the opportunity to collaborate and compete in an 'open', 'permissive' learning environment where the teacher focuses attention on collective knowledge of the group rather than individual competence alone (*ibid.*, p. 342).

5.2.16 Learning through virtual environments

Many vocational learners come from so-called Generation Y (or Z). They have grown up and are living in a world of social networks and inhabit many virtual environments. For more than a decade educators have been considering the degree to which such advances may change teaching and learning. Various researchers have begun to think about precisely how e-learning might be different (Beetham and Sharpe, 2007). Just how fundamentally this may change what goes on in vocational education is an open question.

But certainly in terms of pedagogy, the virtual environment is a new context for learning. You don't need to remember things in the way you do with pens and books. Searching quickly is the norm. Distinguishing good and bad is essential as the searching goes on, as is approaching the whole endeavour with appropriate scepticism. Through searching, it is far easier to see patterns and connections than ever before. Visual imagery is everywhere, with even what were once 2-dimensional maps now potentially 360° photographs of places.

In an educational context, one innovation beginning to be used in vocational education is flipped teaching. Drawing on work by Eric Mazur, the 'flip' here is to assume that, with technology, much of the lecturing and instruction can be done **outside** the classroom and time at college or school can be focused on higher order interactions between teacher and learner¹⁷. This kind of approach would seem to be a significant element of a contemporary approach to developing a vocational pedagogy.

In a construction industry context, Abdel-Wahab (2012) suggests that 'when integrated with rich pedagogical scenarios', Virtual Learning Environments (VLEs) can be used to enrich classroom activities, to provide virtual spaces for student interaction in 3D, and to simulate the operation of work-related equipment, or project management scenarios. He argues for a number of benefits:

- The task environment is free of danger.
- An authentic task, or work environment can be replicated.
- Cost savings can be made.
- Faster throughput of individuals is possible.
- Learners are motivated.
- Learning can be more efficient, and faster.

¹⁷ See <http://www.telegraph.co.uk/finance/businessclub/7996379/Daniel-Pinks-Think-Tank-Flip-thinking-the-new-buzz-word-sweeping-the-US.html#> for a description of this approach.

While recognising that FE colleges, many of which are currently undergoing modernisation, have limited funds with which to invest in such technologies, he proposes that the outlay could be made in tandem with industry investors.

In an analysis of developments in online learning for vocational education and training, Dave Whittington and Alan McLean (2001) predict that growth in capabilities in online technologies will impact profoundly upon vocational education and training. They suggest that vocational education and training will become more widespread, supported by this growth, but that if it is driven forward by motives other than sound pedagogic reasoning, 'this could turn out to be an ironic but minor detail in the history of education' (*ibid.*, p. 161). They argue that the most important feature of the Internet for vocational education is that it is 'dialogical'; it supports dialogue among learners, and between learners and teachers.

Contero *et al.*'s study of engineering students (op. cit) explored the use of sketch-based software applications, concluding that such applications 'can provide an effective way of improving spatial abilities and capturing students' attention' (*ibid.*, p. 10).

5.2.17 Learning through simulation

As well as learning through simulation in virtual environments, learning can happen through role-play and face-to-face scenario planning. Or, bridging notions of 'virtual' and 'physical' simulation, it can be used in the narrow sense of trying out a proposed solution to a problem before actually producing a prototype – whether on paper, or through computer simulation.

In an academic context, Kirk Dorion (2011) discusses the ways in which learners familiarise themselves with (scientific) concepts through use of drama, mime, imagination, or role-play simulations to create dynamic models of phenomena (such as electric circuits or neurons). This approach allows learners to draw on their own experience and to co-construct conceptual models.

Use of simulation is a well-established way of learning and assessing skill development in vocational disciplines. In nursing, for example, simulations of real-life scenarios provide opportunities for learners to practise problem-solving and clinical decision-making in a 'safe' environment (Rush, Acton, Tolley, Marks-Maran & Burke, 2010) where outcomes can be controlled as part of the learning experience.

The simulated set up can work very well in relating classroom and workplace together. The key, however, is that college tutors should be involved with industry, and up to date. But there are pitfalls with simulation. You have to have the right clientele coming in; to have their hair cut, for example. It's no good practising styles that real clients won't want. And some employers will provide a very real experience where they get learners to do exactly what they will be doing in the workplace. We need to ensure that workplaces offer enough variety in their simulations to give learners a number of skills that can be applied in a number of situations.

Lorna Fitzjohn

Simon Mclean's (2012) paper about the design of an industrial simulation for final year BSc Building Surveying students illustrates use of simulation in a vocational context. It argues that simulation can mimic real-world scenarios in order to impart useful work skills. Use of simulation in this sense is likened to 'enquiry based learning' (EBL), which occurs when learners 'own' the process of enquiry, identifying issues and questions, and undergoing enquiry supported by facilitators and resources. Mclean claims that the use of EBL is considered by many educationalists to be superior to traditional teaching for vocational learning, because things that the learner discovers through experience are more likely to be retained. Mclean suggests that a simulation exercise might be ideal 'when stated outcomes are the embodiment of key vocational skills' (*ibid.*, p. 6), although learners must be well supported or 'scaffolded' in a way that is visible – yet discreet – and easily accessible.

In terms of the learning afforded by a simulation exercise:

it reinforces past learning as the learner can test knowledge against a real life scenario. By using the knowledge to resolve problems the learner is afforded access to a whole new canvas for that knowledge, which gives it a greater value. It introduces the concept that learning is not purely restricted to the classroom or within an educational establishment site. (Mclean, 2012, p. 6)

Simulation should meet certain requirements (Mclean, 2012):

- 1 Learners must have full support before, during, and after the simulated activity.
- 2 The tutor's role must not become diminished through the change to simulation 'facilitator'.
- 3 The simulation must be realistic and the roles capable of conceptualisation.
- 4 Learners must have adequate prior learning, basic under-pinning skills, and access to required information.

5.2.18 Learning through playing games

This section would not be complete if it did not acknowledge the valuable role of learning by playing games. These may be elaborate simulations or scenarios of the kind that might feature in 5.2.17, or games which are more like thinking routines such as, for example, Edward de Bono's Six Thinking Hats¹⁸.

Games work well as ways of starting a topic. Using a television quiz show format can be an engaging way of helping learners embed necessary factual knowledge. They can work well in the early stages of establishing a rapport with and within a group, as an approach to team-building and better understanding of learners' wider interests.

Futurelab¹⁹ (Ulrich and Wright, 2010) has undertaken a comprehensive literature review of games in education, which is useful stimulus material for the creation of a vocational pedagogy.

¹⁸ See http://www.debonogroup.com/six_thinking_hats.php

¹⁹ <http://www.futurelab.org.uk/projects/games-in-education>

As with all the methods we have listed, playing games need to be linked to other approaches – for example, personal reflection, when learners might debrief after a game to see how what they have experienced could be applied in the workplace.

A particular benefit of playing games is that they make light of making mistakes: ‘They can act as a safe introduction to various vocational careers – failure is not an issue, in fact it is expected, when learning a game’ (Squire, 2005).

Futurelab helpfully summarises the pedagogical considerations of selecting appropriate games in education. They suggest that the game should have (Ulicsak and Wright, 2010, p. 77):

- › A learning curve – easy to learn at the start and increasing.
- › Relevant educational content – including having:
- › Clear objectives;
- › Clear progression;
- › Appropriate feedback;
- › Opportunities for collaboration and group work;
- › Assessment and follow-up;
- › Opportunities for creativity; and
- › A help section.

This list, of course, could equally apply to most of the methods we have listed in 5.2 and is, therefore, a good place to move on to the final part of this section.

5.3 Mapping methods against categories of vocational education and desired outcomes

As was clear in 5.2, creating a vocational pedagogy involves blending methods in the light of a number of factors of which we have thus far considered two – the nature of the subject, and the desired vocational outcomes.

Here we summarise some of the implications as we map possible learning methods against different kinds of vocational education, and then against desired vocational outcomes.

5.3.1 Categories of vocational education and learning methods

Throughout this report, we argue that vocational education needs to be taught in the context of practical problem-solving, and that high-quality vocational education almost always involves a blend of methods – something which is broadly hands-on, practical, experiential, real-world as well as and often at the same time as something which involves feedback and reflection.

Nevertheless, there are a few generalisations relating to each category which may be helpful.

Table 4: Categories of vocational education and corresponding learning methods

Categories	Issues to consider when choosing learning methods	Some methods that work
People	While practical learning experiences are essential, it is not possible to expose some clients (children, older people being cared for, hairdressing clients for example) to vocational learners until learners have reached a certain standard. In some cases it may never be possible (where a client could be adversely affected by a novice or inexperienced approach).	Watching and imitating (especially using film), using virtual learning environments, using simulation and role play and, sometimes, games.
Physical materials	Of critical importance in working with physical materials is getting the right mix of practice and theory, providing sufficient opportunity to practice in different contexts. Knowing when it is important to describe specific practical skills is important, whether this is helpful before, during or after they are practised.	Learning by watching, imitating, teaching others, drafting and sketching, by being coached and competing against the clock are useful examples.
Symbols	Most vocational education requires the ability to work with words, numbers and abstract concepts whether overtly (as in accountancy) or implicitly (as in electrical installation). In teaching abstract concepts it is important to provide a range of methods, including those which call on approaches that sit comfortably with those with an interest in practical learning.	Learning through games can make the abstract more enjoyable, as can the use of visual models, stories and worked examples.

5.3.2 Vocational education outcomes and learning methods

We now turn to a final set of considerations in creating a vocational pedagogy, the important issue of context.

As in 5.3.1, the chart below is indicative only.

Table 5: Vocational education outcomes and learning methods		
VE outcome	Issues to consider when choosing learning methods	Some methods that work
Routine expertise	Acquiring routine expertise requires time on task and this alone is an important reason for providing vocational learners with lots of ‘hands on’ opportunities. Being told ‘how to’ is no substitute for trying it out.	Watching, imitating, extensive practising, talking things through with peers, giving and receiving feedback, reflective feedback, using VLEs are all examples of effective methods.
Resourcefulness	To be able to deal with the non-routine requires practice in different contexts where the situation or the resources available are novel couples with a deep understanding of the processes of the vocational education in which the learner is engaged.	<p>Whichever method is selected, it is important that both the processes of the specific vocation and the more general learning processes are made explicit. This requires the teacher constantly describing what is going on when they are modelling a skill, regularly giving feedback to learners as to what they seem to be doing and encouraging a culture in which learners feel free to critique each other’s work. Learning through simulations and scenarios can be helpful as is enquiry-based and real-world problem-solving approaches. Prompt sheets generated by learners can be useful in suggesting lines of enquiry which they can pursue when they get stuck. Such lists would include two lines of self-support:</p> <ol style="list-style-type: none">1 thinking through where they may have encountered a similar situation before, and2 scanning their environment for tools which might help or other people who might be able to help.
Craftsmanship	This is a sometimes neglected area of vocational education and the one which can all too easily fall through the cracks of competence-based approaches. It calls for the specific description of certain habits of mind – pride, a determination to strive for perfection and constant self-critique.	Encouraging pride and a passion for excellence is rarely the preserve of a specific method. Rather it is the result of the role modelling of the teacher and other learners, their language used, and the culture in which the vocational education is located.

Table 5: Vocational education outcomes and learning methods

VE outcome	Issues to consider when choosing learning methods	Some methods that work
Functional literacies	<p>There are two schools of thought with regard to the teaching of functional literacies. The first suggests that they are best learned in authentic situations as part of the vocational learning being undertaken. In this case they would be likely to be taught by the vocational teacher. The other is that these are specialist skills which a skilled vocational teacher of, for example, furniture or counselling may or may not have and are best left to specialists.</p>	<p>Whichever approach is adopted there is a need to map functional literacies against specific vocational areas or categories more precisely so that whoever teaches them it is more likely that learners will be engaged.</p> <p>If such functional skills were not acquired first time round (at school) then methods chosen will need to be innovative, especially engaging, and able to boost confidence by requiring only small progress to trigger a noticeable reward.</p>
Business-like attitudes	<p>As with craftsmanship, this is largely about mindset, though it is perhaps easier to describe, involving as it does, explicit connections to customers/clients/service user; markets and competitors; cost, income and profit; financial and other accountabilities. There are also aspects of social responsibility and ethical behaviour which are important.</p>	<p>Not connected to specific methods, it is important to use a vocabulary and language from the target vocation as well as the routines, processes and cultural expectations it brings.</p> <p>Methods which are more authentic will be important, although this needs to be balanced by explicit learning about the needs of the chosen 'business'.</p>
Wider skills for growth	<p>Employers broadly agree that in addition to the skills of their specific vocational area, wider skills, sometimes referred to as 21st century skills are essential.</p> <p>With the pressure of assessment it is important not to allow this critical outcome of vocational education to be squeezed out.</p> <p>The more wider skills can be embedded in the teaching of the vocational education the better. But this requires them to be named explicitly, so a group of, for example, performing arts students will be learning about an aspect of theatre craft and at the same time explicitly be taught about the different collaboration skills which need to be present in an effective team.</p>	<p>Whichever methods are being used it is helpful if a common language is developed, one which works in the specific vocational context.</p> <p>Extensive practice in different contexts will be important too.</p>

6

Vocational education contexts – students, teachers and settings



6.1 Purpose of this chapter

In this chapter we explore the contexts of vocational education, the people and places which provide its distinctive character.

Specifically, we look at the kinds of students who choose vocational education, the ‘teachers’ who provide vocational education, and the physical settings in which vocational education is experienced.

Given that most vocational education takes place in multiple settings – a blend of educational and work-place – we also summarise what we know about how learning is most effectively transferred from one context to another.

6.2 The importance of context in vocational education

Context matters in all kinds of learning. Learning something, for example, while working beside a supervisor on the line in a factory is different from learning to make a dovetail joint in a college workshop, or learning about health and safety legislation in social care via an online course. Each of these situations is different. First, the other learners who may or may not be present will affect things. Second the 'teacher' and his or her experiences, traditions and culture will shape it. And third, of course, the physical location will play an important role.

Jean Lave (cited in Leach and Moon, 2008) helpfully points out that context in learning is made up of two elements – 'arenas' and 'settings'. Arenas are things like colleges, workshops, factories, theatres, farms and hospitals. Each brings its particular culture and each exists separately from any students who might choose to learn in them. A 'setting' is what happens when a learner interacts with a specific arena and the context is created by that interaction. To fully understand vocational context, we have to understand 'settings', although there will be aspects of 'arenas' which will help us to do this.

More generally, through the research of Jean Lave and Etienne Wenger (1991) we now have a much better understanding of the way in which all learning is 'situated' in a particular context. As we saw in section 5.2.6, Lave and Wenger coined a useful phrase, 'communities of practice', to describe the kinds of social learning that these spaces foster. Members of a community pursue a common interest and help each other as they do so. And as they work and solve problems together, so their learning habits and attitudes rub off on each other.

Context is specifically important in vocational education, as most teaching takes place in the dual settings of both workplace and educational institution. A skill may be taught in one setting with a view to being largely applied in another, often in a move from college to workplace. This brings with it two further challenges:

- 1 Ensuring that what is learned theoretically in one context is applied effectively in another; and
- 2 Anticipating how best learners can be taught so that they can prompt themselves to use skills learned in one context when they need them for real in another.

We have already touched upon the first of these in our discussion of practical knowledge in 3.3 and we cover the issue of learning transfer in 6.6.

If you take our music students, they are hugely curious, as are our furniture students, and you can never get rid of them. They would stay here 24 hours, seven days a week. So the idea that young people don't want to learn or get involved in study is incorrect.

Sally Dicketts

6.3 Vocational education learners

To decide how to teach best, we have so far argued that you need to specify the desired outcomes that are being sought, the general kind of arena and setting in which you are working, and the kinds of learning processes that lead most effectively to those outcomes. However, we also need to consider the kinds of learning skills, attitudes and habits that different kinds of learners may bring with them into the vocational context.

In this report, we are focusing on vocational learners aged 16 or more, with our primary focus on colleges, independent learning providers and employer-provision rather than on schools. In our focus on pedagogy, although we are aware that many people access vocational education at some stage of their lives, we are thinking explicitly about those many young and older people who choose the vocational route to enable them to become the plumbers and carers and web designers of the future. In the 14-19 cohort there are 2.5 million young people of which Alison Wolf (2011) shockingly estimates that 'at least 350,000 get little to no benefit from the post-16 education system.'

Where Wolf's focus was on qualifications, ours is on pedagogy.

To help us understand vocational education students, we need to be clear about the degree to which it is possible and helpful (or not) to generalise about the needs of vocational education learners and whether, for example, in terms of their engagement with learning there are specific methods that work better than others. In exploring this area, we touch on routes into vocational education, motivation, and learner self-concept.

6.3.1 The motivations of vocational learners

Learners enrol onto courses of vocational education for a variety of reasons, and broad generalisations should be avoided. Professor William Richardson interviewed for *Mind The Gap* (Lucas *et al.*, 2010) suggested that many students sign up to vocational education because they are keen to leave the school environment at the earliest opportunity. Commenting on the type of person in this category, he said that:

The vocationally-inclined young person ... is aware of the world 'out there', beyond school, and wants to join it, and school feels like it is holding him or her back. So it's not just a matter of their interests or their mentality; the vocational route is the one that seems to respond to that urgency.

(William Richardson, quoted in Lucas *et al.*, 2010, p. 28)

But it is clear that, as a society, we pay less thoughtful attention to the needs of some students. As well as identifying what they call the 'forgotten half' (Birdwell, Grist & Margo, 2011), Jonathan Birdwell and colleagues call for an educational system that is more focused on equipping the 50% plus who do not go to universities with the capabilities to progress through the labour market.

Corson (1985, p. 300) writes that 'observation suggests that the older adolescent's interest in work is more than the result of mere socialisation pressures. Some form of self-fulfilment is required for satisfactory transition to adulthood from adolescence'.

Although many young people are keen to be treated like adults and move into the real world, those for whom the academic route to work seems less promising may be additionally motivated to enter some form of work-related learning. Some enter particular fields of work motivated purely by financial reasons. For some – but not by any means all – learners, a work-related route of learning follows a period of relative or perceived academic underachievement. Learners may or may not associate academic achievements with a low sense of self-esteem.

Part of the attraction for young people is that employers are much more down to earth. They come from a proper company that is making piston pumps. The students are then dealing with people who actually make piston pumps and need piston pumps rather than doing the theory of making piston pumps. It's much more practical. Students like actually listening to graduate employees of Roll Royce, Network Rail, National Grid, Jaguar; whoever it may be.

Lord Baker

Lucas (2010) suggests that the implications of low self-esteem for pedagogy have not been fully explored. In *Mind The Gap* Lucas et al., (2010) noted that within the UK.

Virtually all young people are allocated to a pathway based on their suitability or unsuitability to the academic route, rather than their suitability or unsuitability to the vocational route. Young people are often allocated or counselled into a vocational pathway not on the grounds of talent or interest in those domains, but because they are thought unlikely to succeed at the next level of academic education. Conversely, those young people expected to succeed in academic education are tacitly or openly discouraged from considering vocational pathways.

(Lucas et al., 2010, pp. 15-16)

Indeed, this view is supported by writers such as Richard Arum and Yossi Shavit (1995, p. 187), who consider vocational education as 'a safety net that reduces the risk of falling to the bottom of the labour queue' in their paper on high school vocational education. Lloyd and Payne (2012) suggest that in England and Wales, FE colleges work on a 'deficit model of provision offering a second chance to those who have struggled in mainstream schooling' (p. 3). Similarly, Susan Wallace (Wallace, 2001) focuses on the use of metaphors that headteachers used to describe vocational qualifications to their students. She found that such students were talked of as though automatically less intelligent. While we are not sure whether these deficit models of vocational education are so widely felt, the fact that they keep on surfacing suggests that there must be some truth in them.

In his earlier overview of work-related learning pedagogy, commissioned by the DCSF 14-19 Expert Pedagogy Group, Lucas (2010) addressed the characteristics of 14-19 year old learners. In this discussion he identified the typical teenage learner as relatively volatile, naturally risk-taking and boundary pushing. This period of learning is also one of growth in general, particularly as the young learner continues to develop their own personality.

Ofsted's views of vocational learners can be gleaned from various reports. 'Young people are motivated by practical and active learning, the opportunities to apply their learning to work-related contexts or at work, and by the use of industry-quality resources' (Ofsted, 2010, p. 160). Writing about the success of the 'principal learning' element of the Diploma qualification, which covers the specialist vocational subject content, Ofsted (2010) claims that its:

evidence shows that ... young people's enthusiasm and motivation for this strongly vocational element of their studies is often high ... their enthusiasm tends to be greater in lessons where they are given the opportunity to use and show their competence with industry-standard resources.

(Ofsted, 2010, p. 161 s. 553)

Citing William Richardson, Lucas (2010, p. 8) observes that the more adult atmosphere of work – or life in an FE college – provides a strong motivator for many young people. Unfortunately, and as seen clearly in the Wolf Review (2011), FE institutions and other structures for work-related learning frequently give young people low status routes offering low prospects. As Lucas notes 'the clear implication ... is that the development of richer pedagogic environments for 14-19

[work-related learning] must assume more importance' if young people are to thrive within vocational education and beyond.

Before they even begin a course of vocational education or an apprenticeship, vocational learners are selected on the basis of – among other things – certification of academic achievement from secondary schools. Whittington and McLean (2001, p. 157) question the link between qualification and job content in such instances and we would question the likely impact such a selection process has on individuals who have opted – for whatever reason – not to pursue academic studies. Whittington and McLean pose some interesting ideas regarding selection processes that do not require the usual academic certification. They cite the UK's Open University, and Art schools' use of portfolios, as examples.

Where vocational learners are 'disaffected' or have little experience of success, Hyland (2006) proposes that vocational education should be designed to build confidence. Arguing against the notion that vocational education is too concerned with building self-esteem or emotional intelligence (and thereby less focused on vocational knowledge and skills), Hyland argues that 'for learners, young or old, who achieved little at school and associate learning with anxiety, grief and failure, a 'therapeutic' concern with foundational skills, attitudes and motivations may be exactly what is required' (Hyland, 2006, p. 303). Further, without 'task-specific interventions to overcome problems of confidence, even well-qualified students with extensive work experience can fall by the wayside' (*ibid*).

The focus of this chapter so far has deliberately been on vocational learners in the 14-19 cohort as they are, arguably, the most challenging in terms of engagement.

While older learners will necessarily have more ‘baggage’ in terms of their learning journeys to date and be more likely to be ‘set in their ways’, they also tend to have greater resources on which to call upon. Malcolm Knowles has identified five areas of difference between mature adult learners and younger ones:

- 1 Self-concept: from a dependent personality towards a self-directed human being.
- 2 Experience: a growing reservoir of experience which is a powerful resource for learning.
- 3 Readiness to learn: increasingly related to the developmental tasks of social roles.
- 4 Orientation to learning: from just-in-case to just-in-time, requiring immediacy of application wherever possible as well as a shift away from subject-centeredness to one of problem centeredness.
- 5 Motivation to learn: an internal motivation to learn much less influenced by external factors such as qualifications. (Knowles, 1984, p. 12)

Taken together, these five areas tend to produce learners who are more self-directed and less dependent on the pedagogic decisions taken by those teaching them. Of course there are exceptions to this rule, of which those with low adult basic skills and low levels of self-organisation, are two examples.

6.3.2 The preferences of vocational learners

Learners of all kinds are different from one another; varying in capacity to learn different areas of content, in interests, and in background knowledge. These facts are recognised by educators and cognitive scientists. These differences affect learners’ performance and, teachers will naturally wish to take account of individual differences (Riener and Willingham, 2010).

But while learners have preferences for how they learn, the choices teachers make about how to present material should actually depend more upon the content than on individuals’ preferences. This is because content (whether a health and safety routine, a machine set-up, a dance, or equation gas boiler service) is a more reliable factor in the choice of best teaching methods.

Despite claims for the potential uses of ‘learning styles’ for developing appropriate teaching strategies (eg Cox and Sproles, 1988), there is little or no empirical support for the claim that by matching method of content presentation to individuals’ preferred ‘learning style’, better learning ensues (Landrum and McDuffie, 2010, Riener and Willingham, 2010).

It’s about really knowing the individuals very well at the beginning of the programme and tailoring learning for that person; that actually takes them on through the learning journey onto the next step.

Lorna Fitzjohn

Some of the learning styles instruments are also deeply unreliable. Coffield (2004) found that approaches which, for example, assume that preferences for the visual or the auditory or the kinaesthetic (often referred to as VAK methods) are unreliable and sometimes unhelpful. If vocational teachers are trying to encourage confidence and an ability to deal with the non-routine, then only offering material in one format – pictorially, for example, for imagined ‘visual’ learners – is unlikely to be helpful.

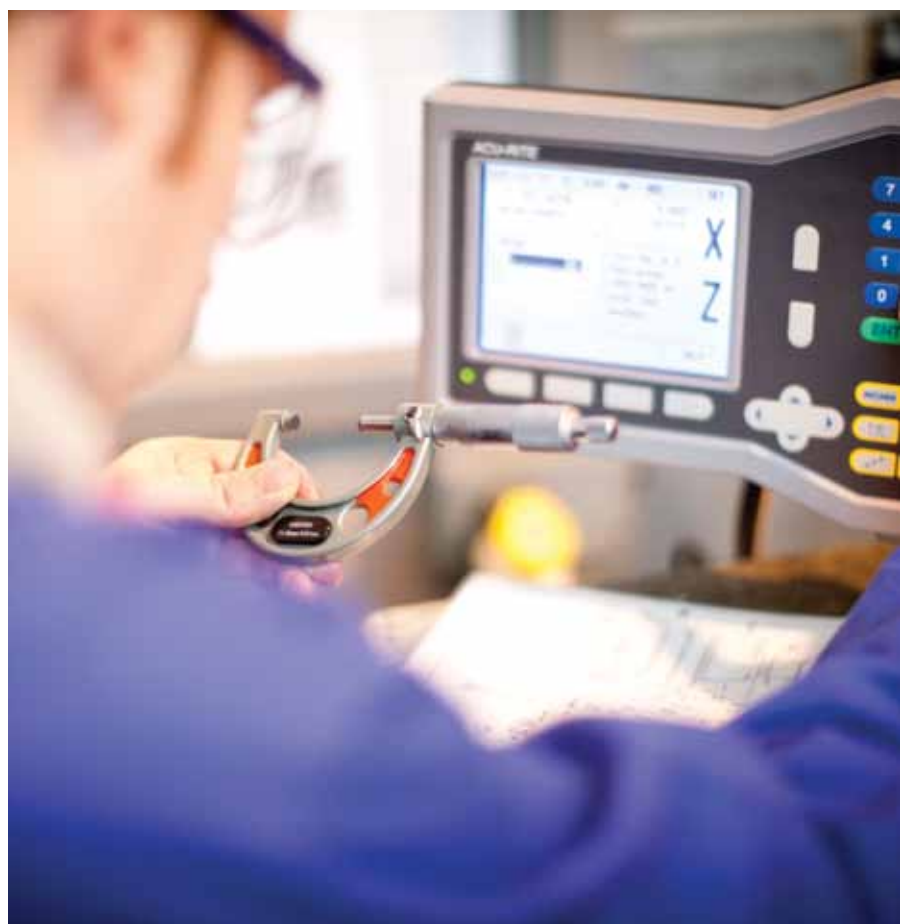
By the same token, good teachers would be likely to mix and match and offer a range of visual, auditory and kinaesthetic approaches in their teaching. And, if learners are venturing into territory which the teacher knows they will find difficult, it would be a matter of common sense to choose a method of learning which is most likely to be suited to the learners’ known preferences.

What is far more likely is that individuals have a preference for a particular mode of content presentation because it happens to be conducive to learning for a particular task (content) for which that person has a high natural ability or affinity. Were they to experience that preferred means of content delivery on a task for which they did not have a high natural affinity, the evidence suggests they would learn no better than if they were presented the content through a different mode; one which lent itself better to that particular content.

As Cedar Riener and Daniel Willingham suggest:

We shouldn’t congratulate ourselves for showing a video to engage the visual learners or offering podcasts to the auditory learners. Rather, we should realize that the value of the video or audio will be determined by how it suits the content that we are asking students to learn and the background knowledge, interests, and abilities that they bring to it.
(Riener and Willingham, 2010, p. 35)

Educators can be assured, however, that learners benefit from both theoretical and practical training, as appropriate to the learning content, regardless of learners’ own personal affinity with one of the other type of input.



I would like to see a much closer relationship between employers and colleges of Further Education. Those working in big employers and responsible for training on the job would be highly skilled people themselves, but they would also be spending some of their time in the colleges teaching. Those in colleges who might have been there for years, they may very well have lost the practical knowledge they had when they were working in industry. Indeed, they may not have kept up to date with changing technology. So I think there has to be a much greater interaction between the educational institutions and the employers they are going to serve.

Richard Pring

6.4 Vocational education teachers

There are currently estimated to be some 200,000 FE and skills teachers in England²⁰. FE teachers include those who:

- Teach in a full teaching role in an FE institution.
 - Teach Skills for Life in an FE institution.
 - Teach in an associate teaching role in an FE institution.
 - Teach HE in an FE institution.
 - Teach FE in an HE institution.
 - Teach FE in a sixth form college.
- (Department for Innovation Universities & Skills, 2007)

In the scope of this report are also those staff who work wholly in business or other organisations but have responsibility for vocational education (of, for example apprentices) and those who work for independent training providers. There are many independent training providers, and each may have multiple trainers. The Register of Training Organisations provides a record of those organisations who have funding agreements with the

²⁰ This figure comes from the Institute for Learning's member handbook, available at: http://www.ifl.ac.uk/__data/assets/pdf_file/0010/15967/2010_member_handbook.pdf
IfL is the professional body for teachers, tutors, trainers, and student teachers in the FE and skill sector. It provides support for professional development and works to influence the national FE and skills agenda. Website at: <http://www.ifl.ac.uk/>

Skills Funding Agency²¹. Compared with teachers, FE staff are often part-time or casually employed on a temporary contract, recruited at an older age, on second careers and appointed directly from employment outside education.

For many years, when recruiting staff to teach vocational education, the emphasis was on people with expertise in their vocation not on their teaching skills. Indeed, until the late 1990s the training of vocational education teachers was largely unregulated. As vocational education has assumed greater importance to the economic and social well-being of the country, so there has been greater government involvement.

Since 2002, new teachers in further education colleges in England have been required to take an approved teaching qualification (Department for Education and Employment 2001), and from 2008, all teaching and training staff from across the sector were required to join the Institute for Learning. Many vocational teachers who started teaching before September 2007 do not have formal teaching qualifications. Citing Ofsted, Orr (2009) claims that some 90% of FE staff in England are employed untrained and complete their Initial Teacher Training in-service, on a part-time basis.

BIS (2012) is currently exploring the issue of professionalisation in its enquiry *Professionalism in Further Education* chaired by Lord Lingfield. In his interim report Lingfield noted that 85% of FE lecturers had not completed the final stage of their supervised practice and were therefore not fully qualified to teach and also critical of both initial and in-service training arrangements. In the final report...

Ofsted is equally clear that the quality of vocational education teachers is particularly variable. In their latest Annual Report (Ofsted, 2011), Ofsted stated that 'within a single college, the variations in the standards of teaching and their impact on learning can be wide, especially between subject areas' (*ibid.*, p. 97). Ofsted were concerned that things had not improved, given that 'one of the key findings in last year's Annual Report was that, across the learning and skills sector²² as a whole, there was too little outstanding teaching. This remains a concern this year' (*ibid.*, p. 90). As a possible clue to the cause of this problem, Ofsted claims that in terms of initial teacher education: 'there continues to be a higher proportion of provision that is no better than satisfactory in the further education and skills sector than in primary and secondary initial teacher education' (*ibid.*, p. 75).

²¹ The Skills Funding Agency (working in partnership with BIS) maintains a record of those organisations with existing funding agreements, and those who are eligible to be selected to be invited to tender for the provision of education and training services. The most recent register, dated 31 August 2012, can be accessed here: <http://skillsfundingagency.bis.gov.uk/providers/programmes/register/> UK Learning Providers can also register at UKRLP, the UK Register of Learning Providers, at <http://www.ukrlp.co.uk/>

²² Ofsted included colleges (general further education/tertiary colleges; independent specialist colleges for learners with learning difficulties and/or disabilities; special FE colleges; and sixth form colleges), independent learning providers, employer-based providers, adult and community learning providers, prisons, young offender institutions, establishments providing secure accommodation for young people aged 15-17, probation trusts, immigration removal centres, dance and drama colleges, and Armed Forces training providers in their inspection of the 'learning and skills sector'.

In terms of what Ofsted hope to observe in lessons, good teaching involves:

- Highly skilled and enthusiastic teachers.
- Use of extensive expertise to inspire a culture of learning and challenge.
- Very effective planning that leads to brisk, lively, and imaginative teaching that ensures learners' differing needs are met.
- Holding high expectations of learners.
- Keeping frequent checks on learning.
- Asking probing questions.
- Setting work that is appropriately challenging.
- Involving learners in evaluating and reflecting upon their learning so that they learn quickly and make good progress.
- Quickly identifying learners who need additional help and providing effective support promptly.

On the other hand, poor teaching is seen when:

- Teachers talk too much, suppressing learners' contributions.
- Unimaginative content is delivered.
- Questioning is rarely sufficiently penetrating to make learners think hard enough to develop their ideas, to research, explore or communicate their ideas independently.
- Learners remain unchallenged and their own expectations of what they might achieve are not sufficiently extended.
- Teaching is dull and uninspiring so that learners find it hard to maintain their interest and make progress.

Despite these apparently critical remarks, there are many excellent vocational education teachers. The City & Guilds Centre for Skills Development (Faraday *et al.*, 2011, p. 3) recently concluded: 'There were many examples of effective practice in vocational teaching and learning evident in the sessions observed'.

The 157 Group and IfL (Gannon, 2012) recently published recommendations from their conference *Great Teaching and Learning* held in May 2012. These focused on the structural contexts within which teachers, leaders, managers, and learners work, to ensure that sufficient time for reflection and innovation is built in across the sector.

Some of the teaching and learning that is going on is outstanding and very good and some subject areas are taught particularly well. One example is the art subjects; particularly fine arts and visual arts.

Lorna Fitzjohn, HMI

In terms of improving the quality of teaching and understanding and using any vocational pedagogy, the central challenge remains that vocational education necessarily calls upon a dual professionalism, requiring both vocational and teaching excellence. Julia Margo underscores the level of difficulty inherent in vocational education in her comment that ‘early research suggests that teaching vocational subjects successfully may be more challenging and require more training than teaching academic subjects’ (Sodha, Margo, Withers, Tough & Benton, 2008).

The weight of tradition in vocational education sometimes seems to weigh heavily on the shoulders of teachers. So, for example, Stephen Darwin, writing about vocational teaching in Australia,

sector wide research also suggests that the vast majority of these full time teachers are part of an aging demographic that is generally remote from recent educational changes and hence broadly inclined to traditional transmissive didactic pedagogies as opposed to those that tend to threaten their conventional identities as vocational teachers ... it is not unreasonable to suggest this has the effect of conserving and modelling orthodox (transmissive) practice, as it must inevitably shape the pedagogical assumptions inherent in the mentoring relationships within this largely casual and part time teaching workforce.

(Darwin, 2007, p. 62)

While this refers to Australian vocational education specifically, its sentiments may also contain some truth in England.

6.5 Vocational education settings

Just as vocational education teachers are drawn from dual professional worlds, so vocational education teaching settings span the worlds of work and of education. Yet whether located in a college classroom or a busy salon, the physical aspects of any ‘designed learning environment’ is hugely influential in terms of the choices ‘teachers’ can take with regard to pedagogy. In a workshop setting, for example, it is easy to enable vocational learners to move between expert instruction, collaborative investigation and practising a skill using specialist equipment. Whereas, on a busy production line or in a small classroom, this blend of methods is much more difficult to achieve.

The organisation of space and its impact on learners is generally under-researched. But to understand ‘settings’ in the sense we used it in 6.2, it seems helpful to think of at least two levels of meaning:

- The physical space; and
- The culture of learning.

6.5.1 Physical space

The places where vocational education takes place include colleges, workplaces, schools, universities and a range of other organisations. Within these there is a much larger list of designed learning environments including, but by no means limited to, studio, workshop, salon, classroom, training room, lecture theatre, garden, field, office, restaurant, computer suite, and virtual. Each space affords different opportunities for learning and teaching.

So, for example, while it is possible to have vocational learners work collaboratively on a task in threes, while sitting in a lecture theatre it is difficult. Or, while it is possible to simulate the atmosphere of a real beauty salon in a tired FE space with ordinary classroom chairs for the imaginary customers to wait on, something of the wider business-like experience is lost.

In making pedagogic choices, the physical settings clearly matter. They can enhance choice or limit it.

6.5.2 Culture of learning

The culture of learning in any setting is defined by the values and beliefs of those who work and learn there. We know from research (Hobby, 2004) in schools what characterises the learning culture of the most successful schools:

- 1 Had the **highest ambitions** for **every** (emphasis ours) pupil.
- 2 Put the **welfare of pupils** ahead of the comfort of staff.
- 3 Focused on **capability and learning** (inputs) to improve outcomes.
- 4 Held teachers accountable to the whole school; promoted **team work** and learning from each other; reduced professional autonomy.
- 5 Were **intolerant of failure** and excuses for underperformance (in staff).
- 6 Valued discipline, reliability and **service delivery**.

While it would be reasonable to assume that some of these translate to vocational learning settings, we will also need to consider other aspects of what constitutes a 'successful' vocational teaching institution. As we have already outlined in 4.1, we will need to be sure that vocational settings also cultivate routine expertise, resourcefulness, functional literacies, craftsmanship, business-like attitudes and wider skills, and this desiderata will have implications for choice of both physical setting and in determining the most conducive learning culture.

Perhaps above all in vocational education, it is important that the culture is such that a powerful relationship is established between teacher and taught, so that the vocational learner is engaged.

In considering culture it is essential that we consider the unintended messages which learners can receive. The phrase ‘the hidden curriculum’ first coined by sociologist Philip Jackson (1968) is a useful way of considering this aspect of culture. By ‘hidden curriculum’ in this context, we mean ‘all the messages and meanings – good and bad – that learners extract from their experience of vocational education’. So, for example, if tools are locked away in cupboards, it suggests that tools are controlled by the lecturer rather than freely accessible. If the ‘actors’ in a simulated business environment constantly slip out of role, then its impact is diluted. If in very practical subjects those leading the session constantly fill sessions with talk and theory, then despite their assertion that they value first hand experiences, this may not be the message that those in their sessions receive. And so on.

VE teachers inevitably – whether consciously or not – use space to underscore their learning intentions and personal belief sets, and this has a considerable impact on the pedagogical choices they make.

6.6 Learning transfer

Transfer of learning is, in a sense, the ‘ultimate aim of teaching’. If something learned in one context can be applied and reused in another context, then the learning has truly become useful. While learning transfer is of interest to academics in fields as diverse as psychology, philosophy, schooling, and vocational education (Cree, 2001, p. 1), with most vocational education practitioners, like pedagogy, it is little talked of.

Yet we know, from the work of David Perkins and Gavriel Salomon (1988) that transfer is assisted by:

- Extensive practice in different contexts.
- The provision of clear models, explanations, and mental models at the point of first learning a new skill.
- Specifically encouraging learners to consider how they might use what they are learning in other contexts, at the point when they first learn something.
- Making as many connections as possible to the learner’s **existing** (emphasis ours) knowledge.

If vocational teachers are aware that, whatever method they select, the principles above can infuse all that they do, transfer may happen more effectively.

David Guile and Michael Young (2003) have looked specifically at the issue of transfer in vocational settings and suggest that, although transfer in vocational education clearly does take place, transfer is not a simple mechanical process. They argue that, traditionally in vocational education, transfer has been taken for granted through two routes, either 'acquired through experience' in craft apprenticeships, or easily moving between learning on the job and off the job college-based injections of technical knowledge (*ibid.*, p. 67). They helpfully distinguish between three kinds of transfer:

- 1 'Consequential transmission', where the learner is changing their identity (learner to worker, for example) and the context is different (workplace rather than classroom).
- 2 'Expanded learning', where something learned in one context is used more extensively in another.
- 3 'Recontextualisation', where the activity is different precisely because it is in a different context (*ibid.*, p. 64).

Knowing that transfer is complex and takes different forms will not on its own necessarily improve vocational teaching. But as vocational learners become more self-aware and reflective it may be possible to coach them to recognise what is going on and modify their actions accordingly. So, for example, encouraging them to visualise what will be different about dropping a plateful of food in a real rather than a training restaurant and how their consequent actions might be different.

All vocational work requires use of functional skills that are part of task performance and successful running of business, what we have termed 'functional literacies' (4.2.4). Citing Taylor, Corson writes:

The more literature, numerate and socially aware the student, the wider the range of personal, social and occupational skills at his command, the greater his confidence and capacity for coping with adversity, then the more likely he is to secure a sure foothold in the world and to work, to derive something of value from his work experience.

(Corson, 1985, p. 297)

Additionally, Ofsted identifies as 'critical to the successful achievement of qualifications': literacy and numeracy skills, which are sometimes taught as part of 'functional skills' units. Ofsted recognises the ineffectiveness of functional skills teaching that is bolted on to a course of vocational education, instead of being seen as a significant and integral part of vocational education. Ofsted suggests that poor integration of functional skills is a major contributory factor to the poor success rates in apprenticeships in recent years.

The Government's approach to functional skills has been to make them mandatory components of all apprenticeships (from October 2012), replacing 'key skills'. From the start of that academic year, all providers of apprenticeships were required to support apprentices in obtaining Level 2 English and Maths (National Apprenticeship Service, 2012). While this ensures they remain within the remit of FE colleges and other apprenticeship providers, it does not ensure that learning of functional skills happens within vocational subject contexts. According to BIS's report *New Challenges, New Chances* (2011, p. 11) (in which these actions feature), the Learning and Skills Improvement Service's (LSIS) CPD programme for Skills for Life teachers will support peer reviews and practitioner research programmes to investigate the most effective pedagogy for English and Maths.

We know from studies of meta-learning (learning about learning) that when teaching learners how to think, they are often unable to make use of such skills beyond the context in which they were taught them. This is because subject matter hugely determines the particular thinking skills required, and provides an authentic context (Beyer, 2008).

Different vocational subjects will provide teachers with different contexts within which to teach functional skills, and the way in which they are applied will depend largely upon which vocational area it is to be used in. There is a strong argument to suggest that learning specific vocational skills and theory, and improving more general functional skills should proceed hand in hand wherever possible and not be learned in isolation. Nevertheless, we recognise that not all vocational teachers necessarily either see this as their role, or have the necessary skills themselves to teach functional skills effectively.

A common issue is that theory and practice are not being linked in a way that makes the whole process transferable into the workplace, and into the future for the individual. This is because the two happen in geographically different places, or at different times. You will have a learner learning about a particular topic in a classroom, and the theory behind it, and then being taught an unrelated skill in the workplace. Sometimes, the learner won't be able to see that the two relate together, if indeed they do. So location and timing may not suit the learner.

Lorna Fitzjohn

7

Designing a vocational pedagogy

7.1 Purpose of this chapter

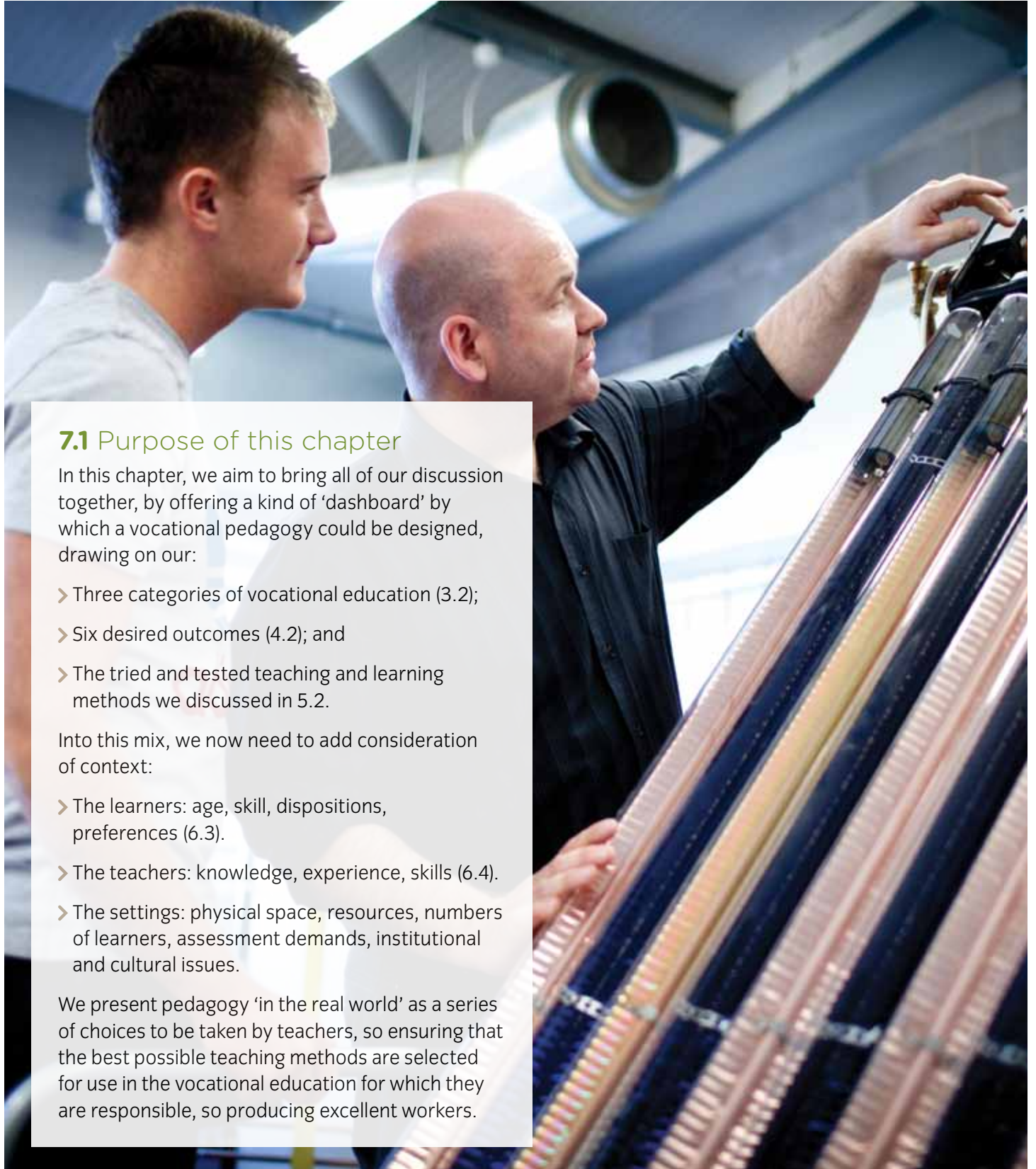
In this chapter, we aim to bring all of our discussion together, by offering a kind of ‘dashboard’ by which a vocational pedagogy could be designed, drawing on our:

- › Three categories of vocational education (3.2);
- › Six desired outcomes (4.2); and
- › The tried and tested teaching and learning methods we discussed in 5.2.

Into this mix, we now need to add consideration of context:

- › The learners: age, skill, dispositions, preferences (6.3).
- › The teachers: knowledge, experience, skills (6.4).
- › The settings: physical space, resources, numbers of learners, assessment demands, institutional and cultural issues.

We present pedagogy ‘in the real world’ as a series of choices to be taken by teachers, so ensuring that the best possible teaching methods are selected for use in the vocational education for which they are responsible, so producing excellent workers.



7.2 What do we know about good vocational pedagogy design?

ESRC's Teaching and Learning Research Programme cites a number of evidence-informed principles for pedagogic development that, they argue, resonate with projects from sectors as broad as school, FE, HE, workplace- and adult-learning, and we will want to take notice of these (ESRC, 2007). They suggest that effective pedagogy:

- 1 Equips learners for life in its broadest sense.
- 2 Engages with valued forms of knowledge.
- 3 Recognises the importance of prior experience and learning.
- 4 Requires learning to be scaffolded.
- 5 Needs assessment to be congruent with learning.
- 6 Promotes the active engagement of the learner.
- 7 Fosters both individual and social processes and outcomes.
- 8 Recognises the significance of informal learning.
- 9 Depends on the learning of all those who support the learning of others.
- 10 Demands consistent policy frameworks with support for learning as their primary focus.

Drawing on the evidence of inspections, Ofsted (2010) suggests that to create a highly effective vocational education environment where young people are motivated, it is critically important to relate vocational learning directly to the world of work, through practical contexts and use of good-quality resources (*ibid.*, p. 160, s. 552). Key aspects of good teaching that must be in place include:

- Teachers have passion, enthusiasm, and subject knowledge. Learners are inspired.
- Classes are well planned and activities are dynamic and demanding. Learning is independent and active.
- Learning tasks are differentiated depending upon the needs, abilities, and interests of learners. This is informed by good assessment.
- Assessment is regular and formative. Individual and group reflections are routine (*ibid.*, p 158, s. 542).

But clearly we need to explore vocational teaching with a finer grain than these broad brush statements do. In its latest annual report, Ofsted (Ofsted, 2011) suggests that the challenge for providers is:

to put in place the rigorous systems and processes of observing teaching, critically reflecting on practice, and supporting targeted professional development, that will enable outstanding teaching and learning to be more widely replicated.

(Ofsted, 2011, p. 90, s. 235)

As part of its skills strategy, BIS (2010, p. 22, s. 28) recognises the importance of ensuring the teaching workforce are professionally qualified, and have relevant and up-to-date skills.

Ofsted suggests that it is imperative that teaching and learning of relevant functional skills (including literacy and numeracy) be integrated fully into a course of vocational education. It (2010, p. 160, s. 549) shares important lessons – from its experience with the Diploma – for how to deliver such training effectively, proposing that a highly effective vocational education environment fuses practical and theoretical learning content:

- Learning can be clearly applied to work-related contexts.
- Teaching methods balance theoretical and practical learning. Practical tasks are engaging.
- Contact with the work-place for learning purposes is well-planned and complements other aspects of learning.
- Vocationally relevant functional skills are practised at planned times.
- Vocationally relevant vocabulary and vernacular is developed.
- Vocationally relevant ‘information and learning technology’ is applied to vocationally relevant challenges.
- Learners are developed as practitioners.

It suggests that in the best lessons:

teachers use their industry expertise to set activities and assignments that are vocationally relevant, link well to students’ work placements, and enable students to make good links between the theory they have been taught and their practical experience.

(Ofsted, 2010, p. 162, s. 556)

Some interesting thinking about the process of designing vocational pedagogy has been done by the City & Guilds Centre for Skills Development (CSD). In particular; two publications, both entitled *Effective Teaching and Learning in Vocational Education* (Ahtaridou, 2010, Faraday *et al.*, 2011).

On the following page, we reproduce the model with which their most recent report concludes, which might be used when developing effective vocational teaching and learning. It is itself derived from work undertaken by David Hopkins (2007). CSD concluded that vocational teaching and learning is not fundamentally different from any other kind of teaching and learning, except with respect to context.

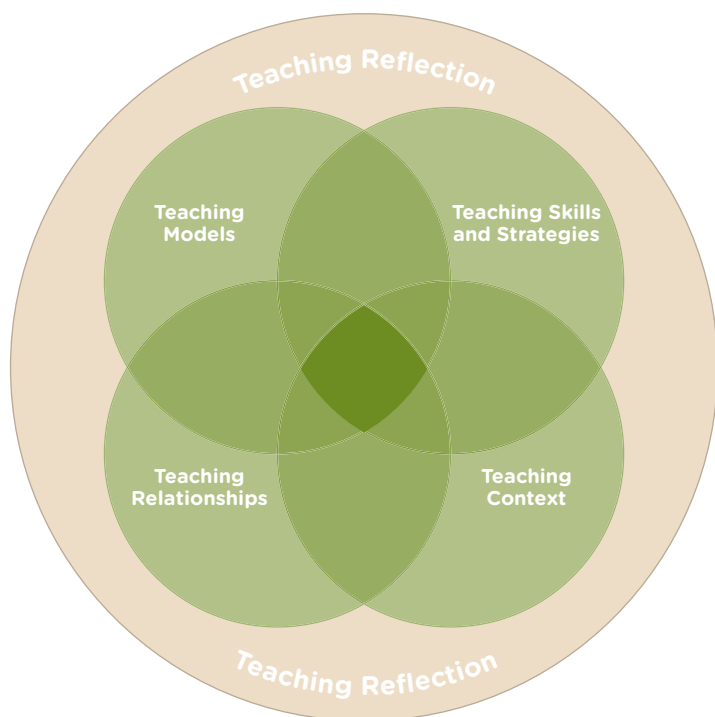


Figure 5 Developing effective vocational teaching and learning (Faraday et al., 2011)

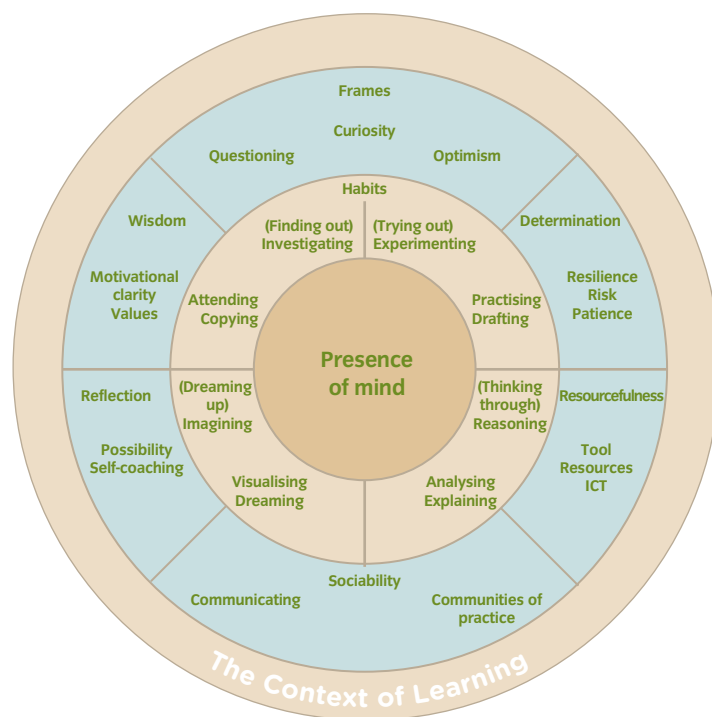


Figure 6 The Centre for Real-World Learning's 4-6-1 framework

While we strongly agree with this emphasis on context (as explored in chapter 6 – see Figure 5, above), we have sought to show that there are some additional considerations to be borne in mind when considering the development of practical knowledge and skill, as well as some distinctive issues when considering the six desirable outcomes of vocational education (4.2).

In our own previous work (Figure 6 above) we have sought to approach practical and vocational education from the 'learner's end' of the experience in our 4-6-1 model. (Claxton et al., 2010)

In our model we sought to show the different kinds of frames of mind and habits of mind which might be desirable in any practical learner. In terms of the current report we were focusing on three of our six desired objectives of vocational education – routine expertise, resourcefulness and wider skills. But we did not specifically explore the development of craftsmanship, functional literacies or business-like attitudes, and in this sense our model, like CSD's is partial.

7.3 Taking good decisions about pedagogy

Although we have explored some of the theoretical issues underpinning the creation of a vocational pedagogy we have only done so as a means to an end – the development of excellent workers by dint of offering them the best possible methods in their vocational education.

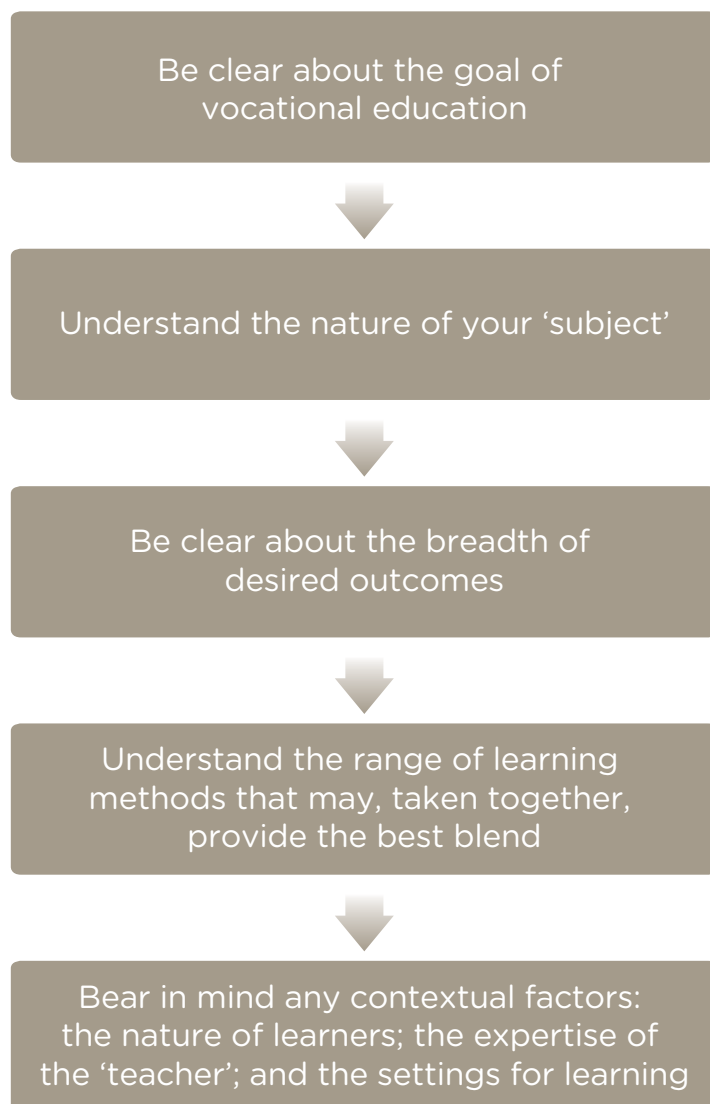


Figure 7 The process of developing a vocational pedagogy

We now attempt to weave together the threads of our argument thus far, and offer a kind of ‘dashboard’ which might form a focus for discussions when taking decisions about pedagogy.

Our argument to this point has been that the process of developing a vocational pedagogy involves a number of stages:

7.3.1 Ten dimensions of decision-making

In thinking about designing a vocational pedagogy, it is important to see it at a number of levels. It must work both at the day-to-day lesson end of things, as well as at the macro end as determined by the various sector skills bodies, and at all points in between – the series of lessons, modules, courses and whole qualifications.

To help vocational course designers and all those who teach vocational education, we offer a series of 10 questions in Figure 8 to help ensure that all of the material we have considered thus far is brought together, when decisions about vocational pedagogy are made.

It is important to point out that these are not binary, either-or decisions.

So, for example, when a teacher is considering their role, they will want to be thinking about which situations call for a more didactic approach, and which will tend to be more effective if more facilitative. Neither end of the spectrum is right or better than the other. They are judgments that require teachers to make an assessment of content, desired outcome, chosen method, characteristic of learner and context.

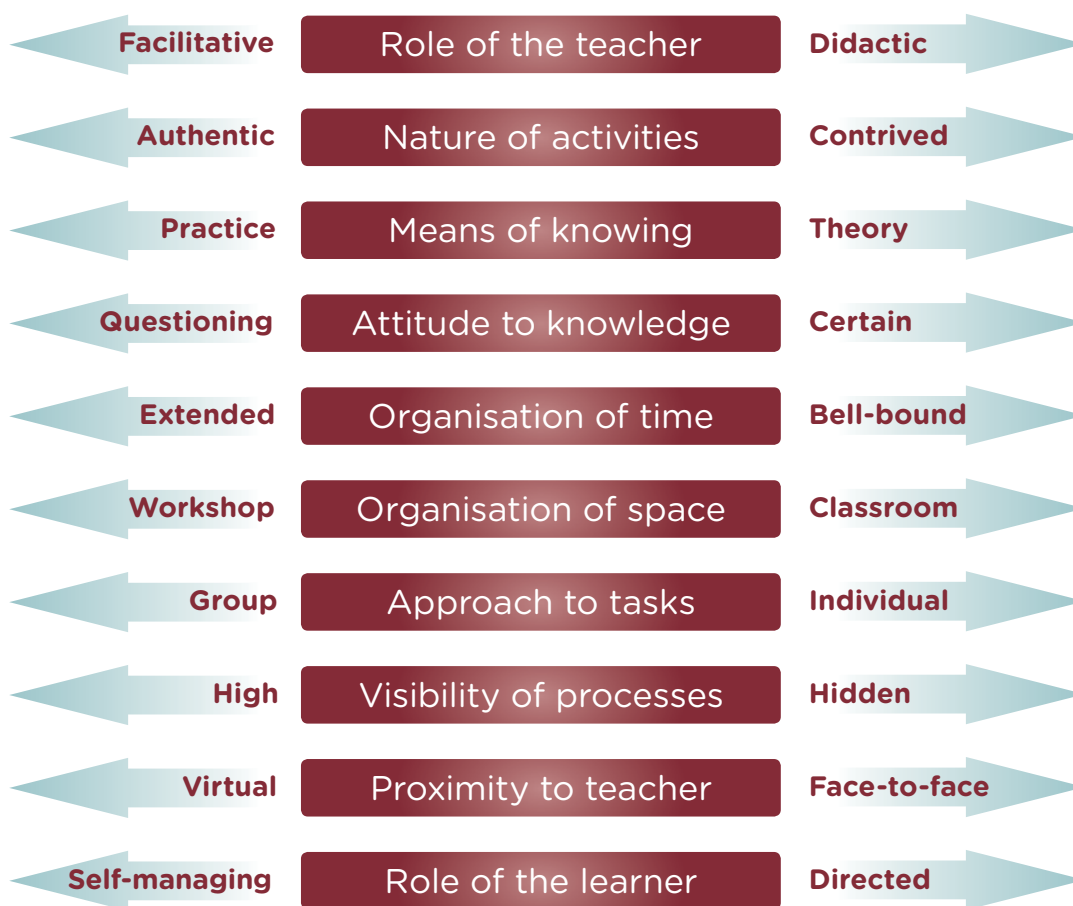


Figure 8 Vocational pedagogy – ten dimensions of decision-making

Nevertheless, there has been a shift in thinking about pedagogic practice, which is moving broadly to the left of our figure.

From the moment a ‘teacher’ walks into a room, he or she is faced with a range of choices. It is our belief that there is now good evidence to help them make the kinds of choices which will improve the quality of teaching and learning, and so be more likely to create excellent workers, and that this is a key element of what is required in improving the quality of vocational education. We also suggest that being explicit about the kinds of choices you are making is

important. Naturally, as teachers become more skilled, they will need to think less consciously about what they do. By the same token, trainee teachers will need to make more conscious decisions.

For each of our 10 areas, we list two or three of the more obviously relevant methods from both ends of the spectrum, make observations about implications for both different categories of vocational education and our six desired outcomes, and offer generalisations about the area with regard to the development of vocational pedagogy.

7.3.2 Role of the teacher – facilitative/didactic

Methods which are obviously facilitative include learning through conversation, through real-world problem-solving, and through enquiry, while those which are didactic include expert demonstration or lecturing. In each of our three categories of vocational education, there will be moments when both didactic and facilitative methods are appropriate.

In terms of the six desired outcomes, resourcefulness – non-routine expertise – clearly requires the kind of trial and error common in real-world problem-solving. Being business-like often requires competitive practices, so learning by competing may well be appropriate, although this is not an excuse for all teaching to be carried out in this mode. In general terms there is a need to shift from more transmissive practices to those which are engaging and interactive, if practical learning is to be best achieved.

7.3.3 Nature of activities – authentic/contrived

Methods which are obviously authentic include learning by watching, imitating or on the fly. Any of our suggested methods can be contrived, depending on the context. So, for example, a simulated activity can be very real or not; input from the teacher can be out of touch or very much about the reality of the vocational practice being learned.

In each of our three categories of vocational education, authenticity is desirable, although when working with people, it is often the case that authenticity will need to be via simulation or role play to avoid upset. In terms of the six desired outcomes, if craftsmanship and business-like attitudes are to be acquired, then this can only really be achieved if the high standards on offer are directly linked to the vocational area being taught. In vocational subjects, there is a real requirement for learning methods to be more authentic.

Part of an apprenticeship or work placement is, by definition, authentic; it is the educational element of vocational education which can sometimes lag far behind. The new UTCs have made authentic treatment of engineering, construction, bio-medical science, and design a key element of their approach.

7.3.4 Means of knowing – practice/theory

Methods which are obviously practical include imitating, practising, real-world problem-solving and sketching, while those which are theoretical include listening to theoretical input, reflection on experience, and coaching which draws out theory. All vocational education subjects require a judicious mix of theory and practice to ensure the six desired outcomes are achieved. In general terms, it is not a question of whether learning should be practical or theoretical, rather it is a more precise understanding of when, in predominantly hands-on, experiential approaches, theoretical constructs should be introduced.

Theory can appropriately be provided just before practising something, via feedback from an expert and after an experience through reflection. Theoretical understanding is essential to the development of resourceful employees. It is also a core element if learning is to be transferred from one setting to another; the learner needs to see patterns, models, connections in order to be able to access something learned in the past to deal with a non-routine situation. Too often in vocational education, theory is offered in chunks which are too big and too separate from practice.

7.3.5 Attitude to knowledge – questioning/certain

Any of the methods we have encountered can promote questioning, and any can suggest a degree of certainty with regard to what is being learned. This applies to all vocational education subjects and all of the six desired outcomes. In vocational education, the ‘master’/apprenticeship tradition is founded on the idea of expertise residing in the person of an older and more experienced worker who is ‘right’ when the learner is ‘wrong’. And in many cases, the common sense of this position is obvious.

But in many cases in real workplaces, there is not one right answer; a non-routine issue requires thoughtful and resourceful problem-solving. More fundamentally, however, vocational education teachers who present their subject areas in terms which are certain and closed-down leave no space for learners truly to engage with what is being learned. Vocational education teachers who model both high levels of current vocational expertise **and** a willingness to present information from multiple perspectives are more likely to motivate their students.

7.3.6 Organisation of time – extended/bell-bound

Most methods can be used in shorter or over longer periods of time. In the workplace all tasks are time-bound in the sense that ‘time is money’. But when it comes to building a real understanding of vocational education subjects and achieving all six desired outcomes, learners need some experience of more extended exploration and opportunities to practice over longer periods of time than they are currently offered.

The unit of work is a day not a lesson, but within any working day there will be variety depending on the vocational area. So designing a website may require extended immersion in the task, as might plumbing a whole new home, while an hour’s aromatherapy or a session in the gym are time constrained. The vocational education course designer’s job here is not to default to the ease of educational timetabling, but to take decisions based according to the learning outcomes desired.

7.3.7 Organisation of space – workshop/classroom

Methods which are obviously ‘workshop’ based include watching, imitating, practising, drafting, conversation, reflecting, and learning on the fly, while those which are classroom-centred include the more obviously transmissive practices. Working with physical materials requires a predominantly workshop-based environment, while work with people and with symbols may not. In terms of our six desired outcomes, if first of all routine and then non-routine expertise is to be acquired, something akin to the workshop or salon or shop-floor or clinic or home – where the tools of the trade can be accessed in as realistic way as possible – is essential.

The organisation of space is as much a mindset issue as one of physical space. If more expansive workplaces and more work-oriented educational spaces are to be created, then it will be important to ensure greater parity of environmental experience. By the same token, in FE colleges it is essential that authentic vocational spaces are designed-in rather than endless bland classroom-like boxes in which it is imagined a vocational teacher can somehow conjure up the reality of the work context.

7.3.8 Approach to tasks – group/individual

Clearly, decisions about this aspect of vocational pedagogy design relate to decisions taken in 7.3.2 and 7.3.11. Methods which are obviously group-based include all of those which require interaction with others, and those which are individually oriented are the ones which either, because the learner is in solo listening mode, or because working in isolation is required. All vocational education subjects and their six desired outcomes are susceptible to being learned as a group or as an individual.

In most workplaces, team-work is essential, and to experience group interaction would seem essential as part of the development of a business-like mindset. In terms of pedagogy, there is too often a lack of precision about exactly what is involved in any group process, what the roles to be played are, and how these will be developed and assessed. To be a successful worker, you need to be able to work independently and in a group. Vocational education teachers need to think carefully about their choice of grouping, group-size, and the choice of methods they select to use.

7.3.9 Visibility of processes – high/hidden

Historically, even great teachers have often kept the ‘tricks of their trade’ to themselves. Learners have to guess what is in their teacher’s mind. Methods which invite high visibility of processes are those – like coaching and reflection – which focus on the ‘how’ of learning. But any method can be taught in a way that takes the learner inside the mind of the teacher, and makes processes explicit.

The evidence is clear here. The more that learners see what is going on as they are learning it, the better they will be able to understand and apply it in different contexts. And here we are talking of both the processes of the vocation – how you make a particular wooden joint or calm a child who is upset or make a spread sheet – **as well as** the learning methods you might be using – watching someone who makes really good joints, pausing for a moment to remember what you used last time a child was very upset, or calling on your personal story of ‘how-to’ guides. Being explicit about process is essential in making connections between theory and practice, and in helping vocational learners prepare for the different contexts in which they will be employed.

7.3.10 Proximity to teacher – virtual/face-to-face

Methods which are obviously virtual include watching film clips on a computer, using computer simulations, some games, and any virtual version of the methods we have earlier listed. ICT is an integral part of life and work today and we all, to some extent, live and work in both real and virtual worlds. Every vocational subject requires us to be comfortable online, but being comfortable online is not the same as considering how best we can be taught that subject or acquire our six desired outcomes. Some vocations exist largely in a virtual world – computer games design, IT, journalism. Even those which deal predominantly with physical materials, or people, depend on IT – the plumber diagnosing a fault in a boiler or the nurse accessing a rapid diagnosis via a hand-held device, for example.

For two decades, education has toyed with the benefits or otherwise of virtual learning, often producing strong advocates for and against it, sometimes contrasting it unfavourably to face to face models of teaching, sometimes promoting it to such a degree that it becomes mindless cutting and pasting of text and content to teach and evidence learning outcomes. A real debate is now happening at last and the flipped classroom idea which we introduced in 5.2.16 requires us to think about what the best use of time in ‘class’ or ‘workplace’ is, and when virtual presentations and other input can best be used. Undoubtedly, there is a trend to use more virtual approaches in vocational as in general education.

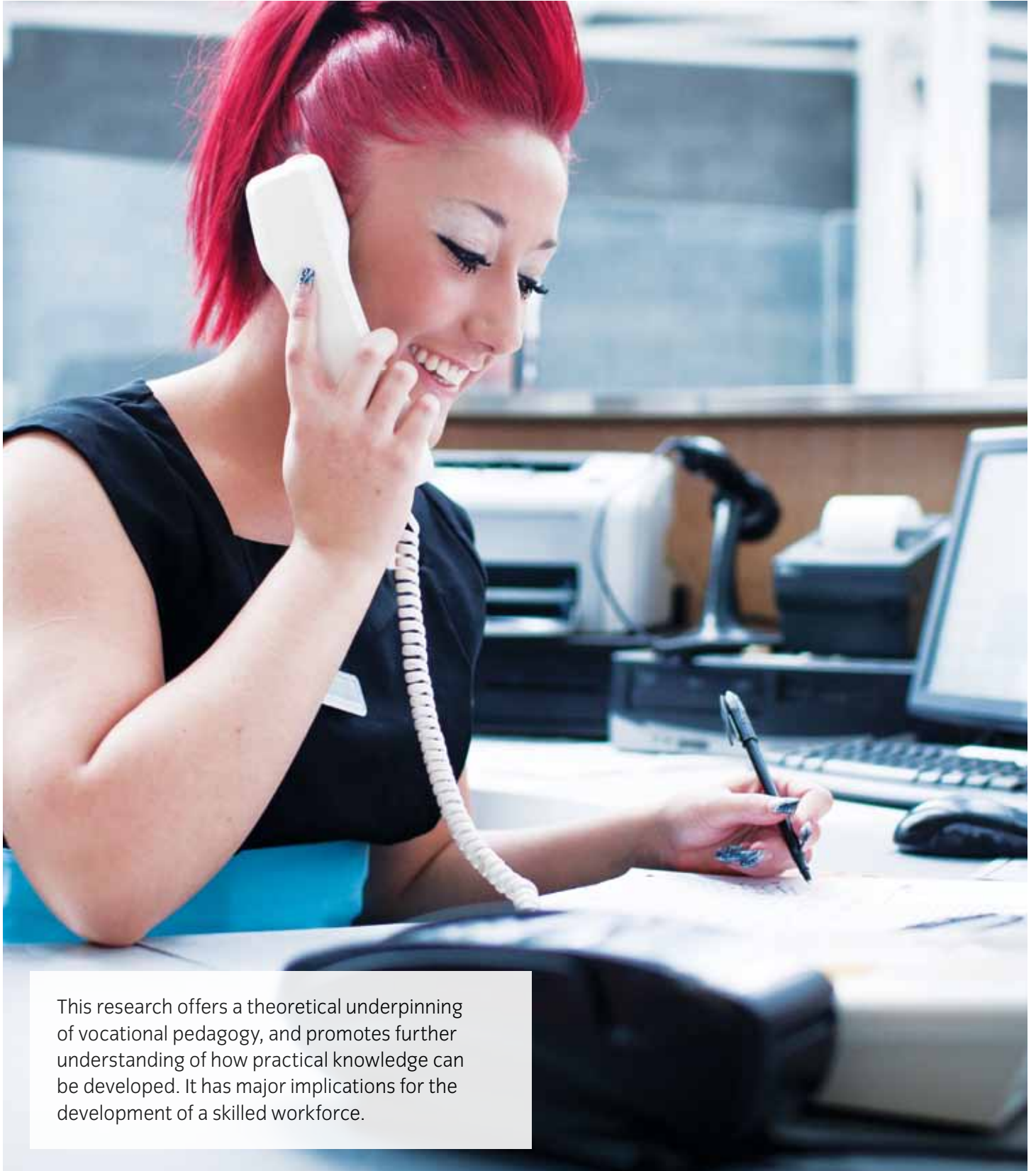
7.3.11 Role of the learner – self-managing/directed

Decisions about this aspect of vocational pedagogy design relate to decisions taken in 7.3.2 and 7.3.8. Indeed, what we are considering here is the opposite of what we discussed in 7.3.2. The ultimate goal of vocational education is to produce excellent workers who can do what they need to do skilfully in largely self-managed ways, knowing when to ask for help and when to defer to others.

The development of resourcefulness and craftsmanship essentially requires many opportunities for learners to use trial and error, learn on the fly, receive corrective feedback and so on. In general terms the evidence suggests that, in vocational teaching, we need more of this kind of learning.

8

Conclusions and ways forward



This research offers a theoretical underpinning of vocational pedagogy, and promotes further understanding of how practical knowledge can be developed. It has major implications for the development of a skilled workforce.

8.1 Conclusions

8.1.1 A broad definition of vocational pedagogy

We offer a definition of vocational pedagogy – ‘the science, art, and craft of teaching. Pedagogy also fundamentally includes the decisions which are taken in the creation of the broader learning culture in which the teaching takes place and the values which inform all interactions’.

8.1.2 Levels of understanding of vocational and practical teaching

We confirm a number of the assumptions sometimes made about vocational education:

- Vocational pedagogy and practical knowledge is an under theorised area of education.
- No comprehensive vocational pedagogy currently exists, despite some useful models and guides for the whole area and some detailed descriptions of pedagogy for aspects of vocational education.

8.1.3 Vocational pedagogy – a proof of concept

While it has not been possible, within the scope of the present project, to develop a comprehensive theory of vocational pedagogy, we offer a proof of concept. We are clear that, to be able to develop such a theory, a number of questions need to be answered. We offer preliminary answers to these questions, and offer a decision-making framework and an inventory of teaching methods which, taken together, will scaffold the design process for any form of vocational pedagogy. Thinking through our series of questions should help any vocational education provider to select the most appropriate vocational pedagogy for their context.

The questions which need to be answered before a theory of vocational pedagogy can be developed are:

- 1 What is the goal and so the desired outcomes of vocational education today?
- 2 Can different kinds of vocational education be usefully categorised in order to make it easier to decide how best to teach them?
- 3 Which learning and teaching methods are best suited to delivering the desired outcomes in a specific vocational subject?
- 4 How is the choice of teaching methods influenced by context – the characteristics of vocational learners, the skills of vocational teachers and the settings in which the learning takes place?

8.1.4 The essence of vocational education

We provide these answers to the questions we posed.

8.1.4.1 The goal and outcomes of vocational education

We suggest that the goal of vocational education is working competence in a chosen vocational area, and that there are six desired outcomes in all vocational education – routine expertise, resourcefulness, functional literacies, craftsmanship, business-like attitudes and wider skills. We suggest how some teaching methods are more suited for each of these six elements.

8.1.4.2 Categorising vocational education

While vocational education is hugely variable, we offer some new thinking on how it can helpfully be categorised into three elements – learning about working with physical materials, learning about working with people and learning about working with symbols (words, numbers and images).

Such a categorisation is potentially useful in three ways:

- It reminds us vocational educators that even in those occupational areas which seem at first glance to fit into one category only, the other two aspects may contribute to the practical knowledge which is required.
- It demonstrates how, even in very different occupational areas, our six proposed outcomes are valid; and
- It invites vocational teachers to consider the full range of teaching methods which may suit some kinds of subjects particularly well.

8.1.4.3 Learning and teaching methods that work

We have found a significant number of learning and teaching methods which work well in vocational education, and we have begun to map these against those desirable outcomes for which they are most suited, and those vocational subjects for which they are best matched.

We suggest that effective vocational teaching requires a blend of hands-on or first-hand learning with critical reflection, collaboration and feedback in the context of strong relationship between teacher and taught.

It is clear that most vocational teachers select methods from a relatively narrow range and that this is limiting the full range of vocational learning.

8.1.4.4 The importance of context

Without wishing to overgeneralise, we suggest that vocational learners have certain characteristics which strongly influence pedagogic choices, especially in terms of their engagement and with regard to the levels of support some learners need.

In line with current thinking about the professionalisation of vocational teaching and learning, we note the degree to which the learning and skills workforce is generally under-qualified and inadequately trained. Yet we suggest that vocational teaching is highly complex.

We describe the huge range of vocational settings and conclude that greater understanding of learning transfer in vocational education is an important element of vocational pedagogy.

8.1.5 Designing a vocational pedagogy

We offer a framework which we believe will help those seeking to design the best blend of learning and teaching methods for the subject they are teaching and the kinds of learners with whom they are working, that also bears in mind the skills and experience of the ‘teacher’, and the settings in which the learning takes place. This framework has 10 dimensions:

- 1 Role of the teacher.
- 2 Nature of activities.
- 3 Means of knowing.
- 4 Attitude to knowledge.
- 5 Organisation of time.
- 6 Organisation of space.
- 7 Approach to tasks.
- 8 Visibility of processes.
- 9 Proximity to teacher.
- 10 Role of the learner.

8.2 Key points in vocational pedagogy design

8.2.1 The role of knowledge

We think it is essential that knowledge and theory be taught in the context of practical problem-solving. It is not sufficient for a qualified worker to be able to parrot back their knowledge when prompted. They have to have been taught in a way that ensures that knowledge comes to mind when it is useful. This awareness of the future context of retrieval, enabling vocational learners to anticipate those contexts, and practising the application of knowledge to support thinking in context, is vital.

8.2.2 Outcomes

Learning needs to take place at each of our six outcomes. Routine expertise, resourcefulness, functional literacies, craftsmanship, business-like attitudes, and wider skills for growth, all need to be developed. Often a learning situation affords opportunities to develop on several of these layers at the same time, and these multiple outcomes need to be borne in mind in the design of learning experiences. Traditionally, the development of routine expertise, for example, has been pursued in a way that might have neglected the development of the wider skills of curiosity, self-correction, and collaboration. Worse, an over-managed pedagogical environment may have systematically deprived learners of opportunities to discover the value of asking questions and self-managing for themselves.

8.2.3 Blending of contexts

We think that it follows from our analysis that the differentiation of learning in ‘college’ and ‘workplace’ environments is frequently dysfunctional. Current best practice ensures that ‘thinking’ and ‘reflecting’ occur in the context of practical problem-solving. The place for traditional classroom-based college teaching is necessarily limited, and its use – while familiar and economical – needs to be clearly justified in terms of a pre-specified set of desired outcomes.

8.2.4 Blending of teaching skills

It follows also that tutors and coaches, whatever their setting, need to be able to integrate the modelling of learning and business-like attitudes, transmitting the commercial practices within which expertise is embedded, the utilisation of knowledge in practical contexts, and exemplifying respectful and effective forms of communication with diverse audiences. This means ever closer functional cooperation between ‘college’ and ‘placement’ personnel. It may also mean the development of a skilled body of vocational pedagogy designers and professional development leaders, within each of our three vocational education domains, to take the lead in blending and deepening the learning practices of all concerned.

8.2.5 Joining up the dots

It will take time and support for all vocational education staff to develop the precision planning that we think is necessary to design optimal vocational pedagogy environments. It is not easy to join up all the relevant considerations we have spelled out, and follow through their implications. For example, if a learning session is principally aimed at the development of a certain kind of routine expertise, then its design may well involve a small amount of modelling and a lot of challenging but achievable physical practice, interspersed with small group ‘reflection sessions’ in which learners are learning to appraise each other’s work in a helpful and respectful

way. And tutors will need to have realistic expectations about the amount of physical practice that is likely to be required by such a group of learners, and the amount of time that will be required. In order to do this, they may need to challenge their own assumptions about the learning preferences and capacities of such a group, and about the rate at which direct instruction and explanation can be translated into practical competence.

8.2.6 Synergies with other domains of practical learning

We think there is a good deal of untapped potential for synergy between the vocational education sector and other kinds of practical learning, including sports coaching and sports science, music learning, and business coaching. Recent developments in sports coaching, for example, have led to many of the same conclusions that we have offered here. The role of the coach (tutor, mentor etc) in empowering learners to take more control of their own learning, and the development of coaching models that use questioning more than ‘telling’ and encourage learners to design, check and improve their own learning experiences, has much to offer the vocational sector. The inclination of tutors to take too much control and to do too much ‘telling’, to the detriment of the development of deeper attitudes of creativity and self-determination, has been well documented in the sports coaching arena, and the parallels with the world of vocational education are well worth exploring.

8.3 Ways forward

8.3.1 Policy-makers

The role and nature of vocational pedagogy is currently being debated by the *McLoughlin Commission on Adult Vocational Training and Learning* and by the *Richard Review of Apprenticeships*. In addition both BIS and DfE have a direct interest in improving the quality of all kinds of teaching and learning in vocational education. We suggest six specific ways forward.

Step one – making vocational pedagogy part of the system

Policy-makers may like to explore our findings to determine ways in which this report feeds into considerations such as:

- Pushing the use of vocational pedagogy in FE teacher training.
- Achieving consensus between political parties, employers, regulators, and teachers on the principles which might underpin a vocational pedagogy.
- Agreeing a set of desirable outcomes (we suggest six in 4.2) which will speak to both employers and educationalists and help to raise the esteem of practical and vocational education.
- Developing better and more accessible guidance on the kinds of teaching and learning methods which are most likely to produce excellent workers.
- Being more specific about improvements to the way apprentices are developed in the medium-term.

- Considering the implications for the professionalisation of the vocational education workforce with regard to both initial training and continuing professional development.
- Engaging directly with employers about teaching and learning methods as well as vocational curricula.
- Using thinking about vocational pedagogy to contribute to better value for money in all aspects of vocational education.
- Persuading diverse funding bodies – from economics, sociology, management and education, to invest in knowledge generation around vocational pedagogy.
- Promoting practice-based research and development within specific occupational areas in order to find out how to make improvements that work and to support practitioners in making these changes.

Step two – creating and sharing excellence

We advocate the creation of a national centre of excellence for vocational teaching and learning linked to a network of regional hubs.

8.3.2 The vocational education sector

A number of groups have a direct or indirect influence on the quality of teaching and learning in vocational education. These include the 157 Group, AELP, BIS, DfE, IfL, ILM, LSIS, NAS, National College, NIACE Ofsted, SSAT, SSCs, and UKCES.

Step three – putting it into practice

We suggest that a broad and representative group of the organisations which most influence vocational education are brought together to discuss the need for a vocational pedagogy and what practical implications this might have for the vocational education sector. Specifically we imagine they may wish to explore:

- Implications for leadership.
- Implications for resourcing.
- Implications for training.
- Implications for further research.
- Opportunities for new forms of school such as UTCs and Studio Schools.
- Opportunities for the next stage of the expansion of apprenticeships.
- Barriers to improving teaching and learning and ways of overcoming these.

While some aspects of the necessary change need guidance from the centre, real and lasting improvements in teaching and learning and in the development of a vocational pedagogy must necessarily be owned by the broader sector.

Step four – engaging practitioners

We propose that a national dialogue with the vocational education sector is initiated, possibly as part of the McLoughlin Commission's ongoing work, to engage practitioners in discussion about the goal and outcomes of vocational education and the teaching and learning methods which work – all in the light of their perceptions of their context. This might also result in the creation of accessible guides to teaching methods, both generically and with regard to different subjects.

8.3.3 Researchers

A small number of specialist academic and third sector centres exist for which we hope our report will provide a useful talking point.

Step five – creating the framework

At the start of our report we noted earlier calls for a vocational pedagogy. We now propose that such a framework document, drawing on our report and the expertise of other specialist centres, be produced. Such a document would be of use as a strategic sector planning tool at one end of the spectrum and as a framework for pedagogic choices within individual lessons for practitioners.

Step six – looking ahead

A number of areas for more specific further research arise from our report. These include:

- Understanding and creating better coaching in vocational education, drawing, for example, on sports science and other forms and models of coaching.
- Understanding more about how the flipped classroom can be applied in vocational education.
- Developing a more detailed route map and flow diagram, from the considerations we have outlined in our report, to scaffold practitioners pedagogical development and design in vocational education.
- Continuing to learn from other disciplines.
- Collaborative internationally, possibly under the aegis of OECD and/or Cedefop.

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